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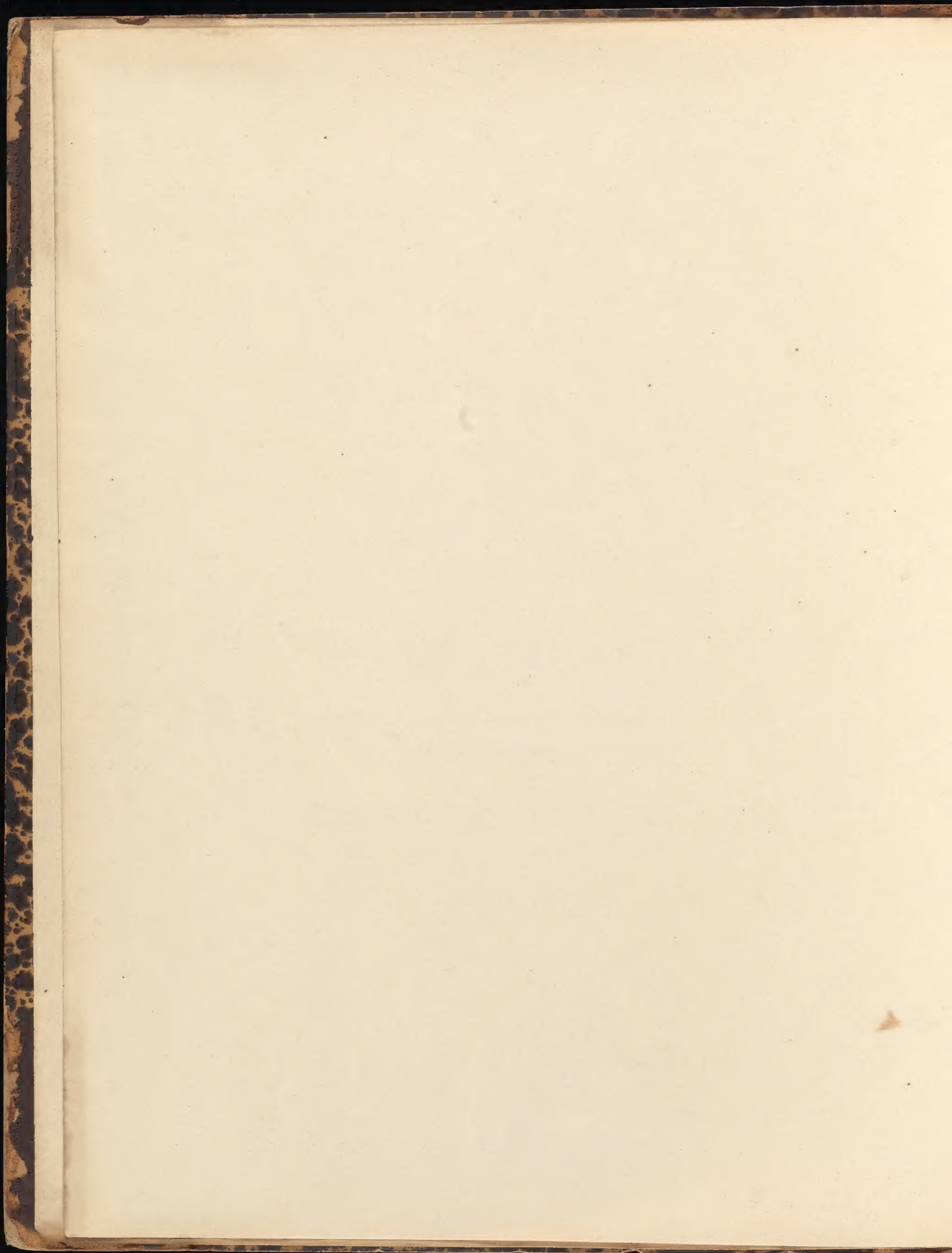
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# THE JOURNAL OF ORIGINAL DESIGNS OF FABRICS

AND

## TEXTILE

## INDUSTRIES.

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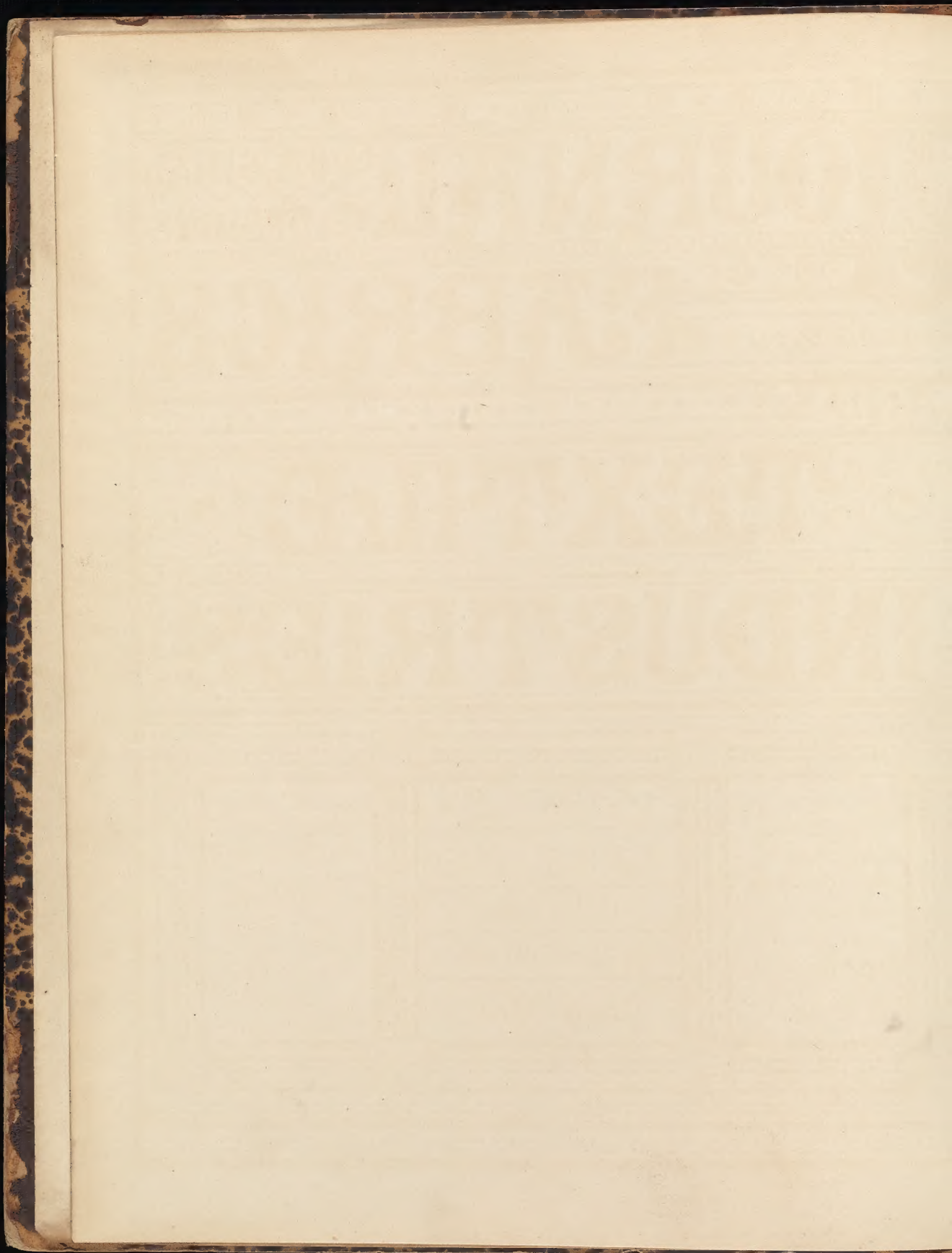
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# The Journal of Fabrics

AND

## Textile Industries.

Vol. 8. No. 47. JULY 12th, 1885. Price 7d.

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The Proprietors will feel greatly obliged if any of their readers, in making enquiries of, or opening accounts with, Advertisers in this paper, will kindly mention the *Journal of Fabrics and Textile Industries* as the source from whence they obtained their information.



### The Yorkshire College.



THE annual meeting of the Yorkshire College was held on June 26th. Professor Bodington, the Principal of the College, read the report, from which we learn that, notwithstanding the progress made in each department in previous years, still greater has it been during the session just closed. The Marquis of Ripon made an excellent speech, in the course of which mention was made of the Victoria University, and

the benefit which the College would derive from being affiliated with it. The question of funds was dwelt upon at some length, and we may state, for the benefit of those of our readers who are actuated by generous feelings, that £60,000 are still required to place the Institution upon a sure foundation, and to enable it to become one of the colleges of the Victoria University. It is not our intention to touch upon all the branches which form the curriculum of the Yorkshire College, and we will therefore pass at once to the department of Textile Industries. In this branch, we learn that in 1875-6 there were 13 day, and 20 evening students, whilst at the present time there are nearly four times that number. Great improvements and additions are being made in the machinery, and every facility is offered to those seeking to improve themselves in textile knowledge. As an evidence of the value of the instruction given in this and

the kindred department (Dyeing), it may be mentioned that several students have gained good appointments during the past session. An exhibition of the pupils' designs was held at the College on the 26th and 27th June. On inspecting these works, we were struck by the weakness of the students in that necessary accomplishment, free-hand drawing, and this leads us to ask the question, Why such an important subject as drawing is neglected by the Council of the College? There are, of course, many branches of designing in which drawing, strictly speaking, forms no part, but for all designs for fabrics of an ornamental character, the first requirement of a designer is to be a good draughtsman. Of what use is it if the student possess the power of conception in design, if he lack that of transmitting to paper such conceptions, through the medium of his pencil, in such a manner as to produce the desired result. We have, on many occasions, seen designs which, but for the unskilful manner of treatment, would have merited praise instead of the reverse. Would it not be well for the Council to take active steps to provide for instruction in drawing, and for the rest, Professor Beaumont, who is practical in all he undertakes, will carry on his good work with students, the training of whose fingers is not neglected, whilst the faculties of their minds are being developed. We may here remark that the best works exhibited, particularly in point of drawing, were those of Mr. Fenwick Umpleby, of Batley, who showed designs in cut velvets. The report addressed to the Worshipful Company of Clothworkers, says:—Mr. Umpleby's designs, which exhibit considerable skill and ability, and excellent workmanship, have been debarred from competition on account of the last session being his fourth at the College; and further, because there was no other student in this class engaged on figured plush goods, the class of fabrics for which his designs are made. The City and Guilds of London Institute held an examination in Cloth Manufacture in May, 1884, and five out of six prizes awarded were won by Yorkshire College students. In the Honours Grade, William Earnshaw took 2nd Prize and Bronze Medal. In the Ordinary Grade, Willie Beaumont, 1st Prize, £3 and Silver Medal; George Shaw Eastwood, 2nd Prize, £3 and Bronze Medal; Walter Dodgson, 3rd Prize, £2 and Bronze Medal; Frederic Barraclough, 4th Prize, £1 and Bronze Medal. A number of students also passed this examination. The following is the list of awards for the session 1884-5:—*Textile Industries, Day Classes.*—*Advanced Class.*—Robert Reid King, First Certificate for General Work; Prize and First Certificate for Designs in Dress Goods; Prize and First Certificate for Designs in Mantle Cloths; and Second Certificate for designs in Double Cloth, Worsted Coatings, and Trouserings. Harry McKeen Ferriday, Second Certificate for General Work. Arthur James Crawford, Third Certificate for General Work. Joseph Naylor, Prize and First Certificate for Designs in Double Cloth Worsted Coatings and Trouserings; and Second Certificate for Designs in Mantle Cloths. Herbert Hepworth Talbot, Third Certificate for Designs in Mantle Cloths. Charles Walter Rowland Smith, Third Certificate for Designs in Double Cloths, Worsted Coatings and Trouserings. *Elementary Class.*—Walter Scott Lord, First Certificate for General Work; and Prize and First Certificate for Designs in All Wool Goods. Arthur Henry Starkey, Second Certificate for General Work; and Second Certificate for Designs in Dress Goods. William Arthur Brown, Third Certificate for General Work. John Holroyd Booth, Prize and First Certificate for Designs in solid Worsteds; and Third Certificate for Designs in All Wool Goods. Harry McKeen Ferriday, Prize and First Certificate for Designs in Dress Goods. Arthur James Crawford, Second Certificate for Designs in Solid Worsteds. William Francis Hilson, Second Certificate for Designs in All Wool Goods. Leonard Holdsworth, Third Certificate for Designs in Solid Worsteds. David Dixon Marshall, Third Certificate for Designs in Dress Goods. *Evening Classes.*—*Third Year Course.*—Fenwick Umpleby, First Certificate for Designs in Cut Velvets. John Addison Walker, First Certificate for Designs in Pompadours. Thomas Charlesworth, First Certificate for Designs in Matelasses. John Barrett, First Certificate for Figured Cotton Warp Mantle Cloths. Edward Rusby, Second Certificate for Designs in Matelasses. *Second Year Course.*—Frank Fox, Prize and First Certificate for Designs in Double Cloth Worsted Coatings and Trouserings. H. Crowther, Second



July 12th, 1885.

THE JOURNAL OF FABRICS AND TEXTILE INDUSTRIES.



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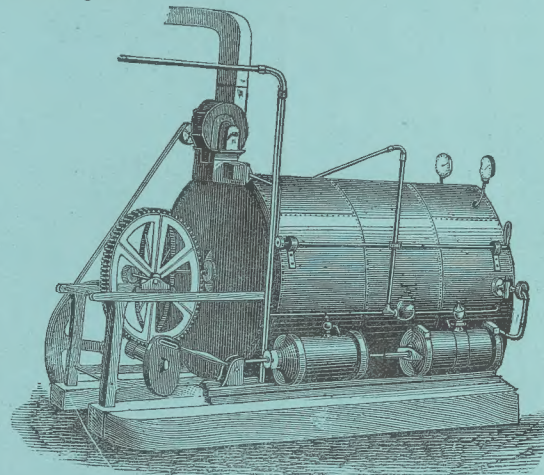
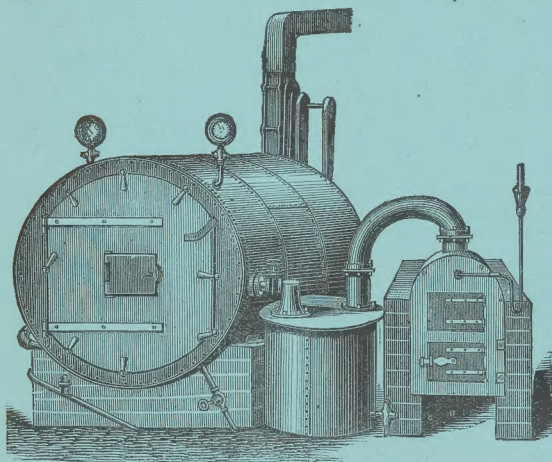
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warps, woollen and worsted wefts combined with cotton warps, and also woollen and worsted warps with cotton and woollen wefts; so that it is important that the calculations pertaining to each should be well understood. The line of the following calculations has been directed towards these requirements. There are shorter methods of calculation which may be used by those fully conversant with the different particulars concerning textile manufactures, but it matters little what the system may be if only simple and reliable.—*The Woollen and Worsted Manufacturers' Handbook*, by Joshua Clapham.



### Silk.—Combing and Spinning.

(Continued from Page 65.)

**F**ROM written records we learn that silk was manipulated in China 2,700 years before the Christian era. To what extent the art had attained we are unable to ascertain, but it is true that when the existence of silk fabrics became known to western countries, the manufacture had reached a great degree of excellence, which proves that it must have been long and successfully practised. The raw material was for ages exported from China and manufactured in Persia, Tyre, &c., and thus the woven goods reached other countries, but the weavers of the material had no certain knowledge how the raw fibre was produced until the middle of the sixth century, (A.D. 555,) when some Persian monks, who had resided in the "Celestial Empire," as missionaries, returned to their home, carrying with them not only silk-worms' eggs, secreted in bamboo canes, but a thorough knowledge of the rearing of the worms, the trees on which they are supported, and the manner of preparing and manufacturing the silk. The monks imparted their knowledge to Justinian, who gave every encouragement for the introduction of so valuable an article of commerce, and the monks superintended the rearing of the insect and the whole process of manufacture. Thus it was from so small a beginning that the myriads of silkworms have sprung, that have supplied the ever increasing demand for silk for the western countries of the world. For some time its manufacture was kept in the hands of the Romans, but at length the worm was introduced into several parts of Greece, and the mulberry tree planted to supply its food, and for about 600 years the Greek Empire was the chief seat of its manufacture in Europe; but in A.D. 1,147, Roger, king of Sicily, carried from Athens, Thebes and Corinth, cities which he had sacked, great numbers of workmen skilled in the production of silken fabrics, to Palermo; here they introduced the rearing of the worm and the manufacture for which they were so justly noted. From this city the art soon found its way into Italy, and her cities became renowned for the quantity and quality of these silken materials; neither was Spain behind in her desire to share the benefits arising from this trade. At length in the reign of Louis XI., in 1,480, workmen were obtained from Italy and commenced the manufacture at Tours in France, but it did not prosper until the reign of Francis I. The great wealth arising from this new trade made James I., of England, very anxious to have it introduced into this country, accordingly it was several times recommended from the throne, and in the most earnest terms, that mulberry trees should be planted for the propagation of the silk-worm, but unhappily without effect, though, from certain records, it appears that the worm thrives and works as well in England as in some other parts of Europe. As soon as the silk-worm has arrived at the size and strength necessary for beginning his cocoon, he makes his web—that is the name given to the slight tissue which forms the commencement and ground of the admirable work. This is his first day's employment. On the second day he forms his ball, and covers himself almost all over with silk; the third day he is quite hidden, and the following days he employs himself in thickening and strengthening his ball. He always works from one single end, which he never breaks by his own fault, and which is so fine and so long that those who have examined it attentively, think they speak within compass when they affirm that each ball contains six English miles of silk. In ten days' time the ball is perfect, and is now ready to be taken down from the branches of the mulberry tree, where the worm has hung it. But this point requires a great deal of attention; some worms are lazier than others, and it is dangerous to wait until they make themselves a passage, which usually happens about the fifteenth day of the month. The finest and strongest balls, as to web and colour, are kept for the production of eggs. The weight of the cocoons generally determines which are those of the male and which of the female, the latter being the heavier and the rounder. The balls kept for producing eggs are laid up in a dry room, and in ten days' time they lose about  $\frac{7}{8}$  per cent. of their weight. The greater bulk of the cocoons is sorted into nine qualities. 1. Good cocoons, which are strong and firm, and not very large, but almost equally round at both ends, and free from spots. 2. Calcined

cocoons, in which the worm has died after having finished its work, and is reduced to a powdery substance. 3. Cocalons; these are not so firm as good cocoons, but are larger. 4. Choquettes; in these the worm has died before completing its work. 5. Soufflons; these are too soft and loose to be unwound. 6. Dapion (double cocoons); these are often kept for seed because they are not easily unwound. 7. Perforated cocoons; from these the moth has escaped. 8. Pointed cocoons; one end rises in a point and breaks off when a small quantity of silk has been unwound, and so the thread is spoiled. 9. Bad choquettes; the silk is spotted, rotten, and blackish in colour. The life of the chrysalis is destroyed before the cocoons are unwound either by exposure to the sun or by artificial heat. The floss silk is removed from the cocoon by opening it at one end and slipping out the cocoon. The balls are of different colours, but it is not necessary to separate them, as all the colour will be lost in future scouring; but in reeling, it is needful to use cocoons of one quality, because different modes of treatment are required for different qualities. The cocoons are soaked in warm water, kept by a steam-pipe or a charcoal fire, at the proper temperature, until the natural gum is softened, then a reeler very gently brushes the cocoons with a small birch rod to which the loose ends of silk adhere, and by which they are brought out of the water; then four or five (sometimes even as many as thirty) are twisted together by the fingers into one thread and put through a metal loop which rubs off any impurities that may be attached to the fibre; it then passes on to a reel in such a manner that one thread does not overwrap another, before the gum has had time to become hard by exposure to the air. When one fibre breaks another is laid on and adheres to the gum, and as the threads become finer towards the termination of the cocoon, it is usual to supply new ends in order to render the fibres of uniform thickness. The cocoons are never wound off completely, but the husk containing the chrysalis and the floss silk are used as waste. Silk, being properly an animal fluid hardened by the air, is improved or depraved in its nature or quality according to the nourishment the worm receives from good or inferior leaves. The value of silk, therefore, depends greatly on the nature of the spring of the year. A spring warm, and moderately moist, is most suitable for a good supply of mulberry trees; too much rain has a tendency to rot the leaves, southerly winds injure the worm, and northerly winds their food. Thus a rearer of worms, who observes the winds and rains during the spring of the year, will be at no loss to foretell what kind of a silk crop may be expected to follow.

(To be continued.)

### A New Loom without Shuttle.

A Batley gentleman, writing from San Francisco to the *Batley News*, says:—"I was startled to hear of a new loom, without shuttle, having been invented and patented by an Englishman from New York, but who has been in this city some years as a mechanic, or machinist for himself. I have no wish to startle your readers, but I at once repaired to the place, which is not ten minutes' walk from my office, and there sure enough saw the loom for myself. It is quite an ordinary loom with the new patent attached, and if it will do the work that the inventor claims it will, then hundreds of thousands of power loom weavers will be thrown out of work. This is a sad reflection; but it is no myth, the loom is here; I have seen it working not half an hour ago. The inventor claims that one man or woman can mind 50 of these looms, but even if you reduce this to 20, then 19 out of 20 weavers (as soon as the patent is adopted) will be thrown out of work. At each end of the loom (which is an ordinary loom, minus the boxes), stands on the floor a large coil of weft, supposed to last ten hours, running at full speed. Through the sheath runs a sort of steel hand, with fingers at each end. These fingers take the weft from one side to the other as quick as lightning. The weft is cut at the list, and the two fingers at the other end of the hand seize from the grip the other weft and take it across the warp through the sheath as by a shuttle. The consequence is the piece at the sides is jagged and raw, with loose ends, but in every way else it is just the same as any other new woven cloth. A motion behind the gears stops the loom when an end breaks, just on the same principle as the loom is stopped when the weft breaks. Many advantages are claimed for the new invention; there is really less waste of time, no changing of shuttle, and no waste of weft. A patent has already been taken out, and a company formed, with a capital of \$1,000,000 to work it." The Batley gentleman was startled to hear of the above. So are we. It seems too much to believe. A loom with such undoubted advantages, that 50 or even 20 of them can be successfully attended to by one operative! But "wonders never cease," and remembering how often the truth of this saying is forced upon this generation, we have no wish to be sceptical. All the same, we should like to hear more about this wonderful piece of mechanism, which, according to our authority, must revolutionize the manufacturing world. We have heard of a loom invented some years ago on somewhat similar principles, but it was not found to answer expectations.

The cultivation of ramie in Egypt, which was attempted, has had to be abandoned, until means are found to offset the damaging influence of dry winds which prevail there during the spring, and prevent the development of the plant.



Certificate for Designs in Matelasses. George Ruddlesden, Second Certificate for Designs in Double Cloth Worsted Coatings and Trouserings. Edwin Austin, Third Certificate for Designs in Double Cloth Worsted Coatings and Trouserings. *First Year Course.*—Matthew Henry Gaunt, Prize and First Certificate for Designs in All Wool Goods. James Jennings, First Certificate for Designs in Cotton Warp Goods. John Ernest Rodley, Second Certificate for Designs in All Wool Goods. Joseph Charlesworth, Prize and First Certificate for Designs in Matelasses. *Dyeing Department. Day Classes.*—Lectures on Colouring Matters.—Charles Topper, Prize and First Certificate. William Alexander Clark, Second Certificate. *Dyehouse Practice.*—Charles Topper, Prize and First Certificate. *Evening Classes.*—Lectures on Natural Colouring Matters.—Joel Moore, Prize and First Certificate. Herbert Stott, Second Certificate. *Dyehouse Practice.*—Herbert Stott, Prize and First Certificate. Ernest Hickson and John Rider Windsor were bracketed and were awarded Second Certificates.

### The "Counts" of Yarns, &c.



ONE of the chief difficulties which confronts the enquirer after the construction of textile fabrics is as to the meaning of the terms used in the designation of yarns, and the variety of those terms even as representing the same meaning, and which again differ similarly in different localities, according to individual application. This matter is analogous to the different dialects spoken, and almost as confusing as to the meanings to be attached to the expressions used; yet each person knows for himself what is represented, though the difficulty of communicating that knowledge to others is apparent to the observer. This state of things need not excite wonder when it is considered how rough and ready have been the means by which the technicalities employed in textile manufacture have been transmitted from generation to generation. The system seems to have been built up on a combined series of indefinite items, the full comprehension of which is known to comparatively few, who, however, have been able to obtain it more largely from continued experience rather than from any intelligent knowledge of the principles which govern the foundation. As a result, the methods of calculation are as diversified almost as the number of manufacturing localities, and each locality, again, is equally divided in the same respect. This want of uniformity is a cause of great inconvenience to a person moving from one district to another, as he must either engraft his own procedure into those with whom he co-operates or become familiar with the custom which prevails where he is situated in order to ensure a mutual understanding. This diversity may have arisen from the different bases of the "counts" of yarn, or that each district has adopted a basis of its own peculiar to itself, the origin of which it would be difficult to establish. The counts of yarn are based upon two elementary principles—viz., weight and length—and all the calculations used in textile manufacture have their foundation in this simple statement. Unfortunately for a common understanding, the weight is moveable, as representing certain lengths of yarn. Hence the confusion which exists between districts engaged in the same particular industry with regard to their methods of calculation. The greatest diversity prevails in the woollen industry, and each system is localised, as the Leeds, Dewsbury, Huddersfield, Holmfirth, Stockport, West of England, and Scotch counts, and scarcely two are to be found exactly alike, and yet all are reducible to one common and easily-understood basis. The most rational method of any is that in use in the Huddersfield district, and that is that No. 1 yarn represents 1 yard to 1 dram as the standard, and as many yards as go to make 1 dram the yarn is designated by that number. The yarn is spoken of as so many yards to the dram, or so many skeins, which is the same thing, when referring to its relative thickness. Thus, 10 skeins or 10 yds. to the dram; 20 skeins or 20 yds. to the dram; and so on, whatever the number may be. Therefore, the standard weight is 1 dram avoirdupois, and the number of yards to that weight is regulated according to requirements. One skein means 1,536 yds. for 6 lbs. weight, called a "wartern;" and as there are 1,536 drams in 6 lbs. avoirdupois, 1 skein represents 1 yd. to 1 dram, 16 yds. to 1 oz., and 256 yds. to 1 lb.—that is, for No. 1 yarn. For any other number of yarn it is so many times those particulars. The skein table will fully explain this. For the measurement of yarns, the reel is 1 yd. in circumference, and so many yards, as desired, are revolved upon it in order to weigh the 1 dram weight. Although 1 dram is the standard it is not imperative to use the 1 dram weight only in order to ascertain the number of the yarn, as 2, 3, 4, and even an 8 dram weight may be employed, so that a better average of the size of the yarn may be obtained, of course, remembering that whatever the weight may be in the scale it represents so many yards more than may be required by the 1 dram—as, for instance, 10 yds. for 1 dram, 20 yds. for 2 drams, 30 yds. for 3 drams, and so on, and still the thickness of the thread is the same.

The employment of one weight in the reeling or measuring of yarn, and gaining the number of yards requisite to balance it, is preferable to

the use of a number of different weights in the scale, and reeling so many times any standard number to balance the weight required for certain thicknesses of yarn. This latter system is adopted in the West of England, where 320 yards to the pound is the standard or No. 1 Yarn. While in Huddersfield the count of woollen yarn is based upon a reel 1 yd. in circumference, and 256 revolutions of No. 1 Yarn upon it give 256 yds. to the pound; in the West of England the same is based upon a reel of 1½ yds. in circumference, 256 revolutions of which give upon a reel of 1½ yds. to the pound. The difference in the two counts, therefore, 320 yds. to the pound. The difference in the two counts, therefore, stands thus: Huddersfield No. 1. Yarn, 1 yd. to 1 dram; West of England No. 1 yarn, 1½ yd. to 1 dram; so that while 20 skeins of the former method give 20 yds. to the dram, in the latter 20 skeins represent 25 yds. to the dram. Other districts are equally at variance in this respect, and to trace them all to their particular standards would necessitate a very lengthened essay, and thus add to the dimensions of the book. The following calculations are based on the standard of 1 skein or 1 yd. to the dram avoirdupois weight, as being the most rational of any, as by it the basis is both simple and reliable. This has reference only to the woollen industry, but that of worsted requires a different method, necessitated by the difference of the meaning of the "count" of yarn. While the woollen count has its standard on 1 yd. to the dram, or 256 yds. to the pound, that of worsted is based upon 560 yds. to the pound, or 2 yds. 6½ in. to the dram, and called No. 1 Worsted. Any given number of worsted, therefore, means as many times 560 yds. to the pound, and is called by that number, as 20's worsted means 20 times 560 yds. to the pound. The worsted yarn table will make this matter plain. Worsted yarns are also designated as "single" and "two-fold." When written as single, say 20's, the number given represents so many times 560 yds. to the pound; but when written as two-fold, as 2/20's, it only represents half the number given, and is reckoned as 10's, or 10 times 560 yds. to the pound. Put in another way, say 25's single, an equal two-fold worsted must be 25/50's, because two single threads are twisted together to be equal in thickness to one single thread. In using the worsted yarn table it is necessary to be certain as to whether a single or two-fold yarn is meant, and the number of worsted required accordingly. In carrying out the worsted yarn table to drams, it is in order that its equivalent may be seen in woollen, and *vice versa*. Again the cotton count is different to those of woollen and worsted, being based upon 840 yds. to the pound, or 3 yds. 10½ in. to the dram, and called No. 1 Cotton, and any other number means so many times 840 yds. to the pound. Cotton yarn is also spoken of as single and two-fold, and when written as, say, 24's, it must be taken as representing 24 times 840 yds. to the pound; but when written as 2/24's, meaning two threads twisted together, and forming that number, it must be reckoned by the half of the number, as 12 times 840 yds. to the pound. While the woollen yarns are designated by the term "skeins," those of worsted and cotton are termed "hanks." The meaning is the same so far as the terms go, but different numbers are represented by them. They may be summarised thus:—

Woollen, 256 yds. per lb. ....	1 skein.
Worsted, 560 yds. ....	1 hank.
Cotton, 840 yds. ....	1 hank.

The woollen count, having its foundation based upon the dram, becomes the test for other kinds of yarns as to their relative length or thickness. Thus, if we require to know what size of woollen No. 20's worsted is equal to, we first find the number of yards there are in 20's worsted and divide by the woollen unit, 256, and the answer is given in the number of yards to the dram:—

560	20's Worsted.
256	Woolen count: 256)11200 yds.(43½ yds. to the dram, or so
11008	many skeins.

192	2
256	1

Again, with reference to cotton, what size of woollen is represented by No. 16's Cotton, single?

840	16's Cotton
256	Woolen count: 256)13440 yds.(52½ yds. to the dram, or so
13312	many skeins.

128	1
256	1

By dividing the cotton count by the worsted standard, their relative sizes may be obtained. For instance, what number of worsted does 24's Cotton represent?

840	24's Cotton
560	Worsted count: 560)20160 yds.(36's Worsted, or 36 hanks.
20160	

The three great industries, woollen, worsted, and cotton, are becoming more and more amalgamated in their applications. There are goods composed of woollen wets and cotton warps, worsted wets and cotton



disproportion between the English and German prices will be much less than it has hitherto been," and buyers will be pretty sure to notice the difference. At the recent Pesth Exhibition a fine display was to be seen of English agricultural machinery patented in Hungary, and it seems to be worth the while of British manufacturers to watch the markets and agricultural shows of the country a little more closely than they do. In Bosnia and Herzegovina it is stated by an eminent authority that British goods almost rule the markets and defy Austrian competition. Unfortunately this is not the case with all goods. A report before us mentions that shoddy, once largely imported to Hungary from England, is now produced in Austria in superior quality and at a lesser cost; and that even in the manufacture of woollen yarns, Austrian competition cannot be overcome in the Hungarian market. But that is no reason why English manufacturers should not make an effort to compete with Germany in the Austrian as well as the Hungarian markets, whether they can compete with the Austrians themselves or not.

### Ornamentation of Textiles.

(Continued from Page 63.)

**R**OM a very early date we know that at the Abbey of Saint Florent de Saumur, the monks were famous for their skill in the manufacture of textile fabrics and tapestries; such monastic workshops existed everywhere. There are several documents which refer to carpets made of wool, and ornamented with flowers, animals, and the portraits of emperors and kings, which were manufactured in the French convents during the tenth and eleventh centuries. The importance of these sacred ateliers everywhere declined in proportion as the secular workshops developed, and the competition of the latter with the ecclesiastical establishments was very much strengthened by the trade established by the Moors in Spain, as well as by that of Flanders and Artois. After the decay of the monastic workshops, the royal courts attached to themselves the skilled craftsman, who had ceased to be employed in the cloisters; we have it also on good authority that more than one great lady condescended to direct the manufacture of the rich materials that were required for her own personal use, and for the decoration of her home. There has been much controversy concerning the pieces of tapestry, generally known as Bayeux tapestry, which, according to tradition, were worked by or under the management of Matilda, the wife of the Conqueror. A photograph of this exquisite piece of fabric may be seen in the museum at South Kensington; it is a representation of the events connected with the invasion and the conquest; the size of the original is said to be 1 ft. 8 in. wide and 214 ft. long, it is divided into 72 compartments, and contains more than 760 figures of beasts and birds, 623 of men, 49 of trees, 37 of buildings, and 41 of ships. Giselle, the wife of Saint Stephen, was very clever in the manufacture of textiles, and by her inducement, her royal consort, the King of Hungary, attached to his palace an establishment for weaving and embroidery, and to this queen's female servants is due the honour of the invention of the famous embroidery generally known as "Point de Hongrie," by which expression are technically known three stripes laid side by side, ladder fashion, used chiefly in embroidering the plumage of birds. The Anglo-Norman ladies are said to have been exceedingly clever in ornamenting textile fabrics. One of the most valuable of our old historians, William of Malmesbury, who lived in the 11th century, when describing the art of weaving, says—"the shuttle is not filled with purple only, but with various colours, moved here and there among the thick spreading threads, and by the art of embroidery, the woven work is adorned with various groups of figures." The looms of Artois, which, during the terrible Merovingian period, had almost ceased to produce, during the second French dynasty, were revived, and at last, they recovered their former renown; the products of these looms had already been highly esteemed in Imperial Rome, and though the Romans may have preferred the work of the Phrygians, they still had recourse to the woollen stuffs of Gaul, the reputation of which had long been universally established. The stimulus imparted to trade by the first crusade was destined to give great expansion to the art of textile ornamentation; from history, we learn that the French and Italian ateliers received thereby a wide and lasting development. Previous to the Roman invasion, Britain appears to have been far behindhand in the art of manufacturing cloth, and knew nothing of weaving, but on the other hand, they had, from the earliest of times, possessed native textile products, varying both in the materials and designs, but of the same colours as those of the distinctive garments worn by the three traditional Bardic orders. Milton gives us a very curious description of the inhabitants of Britain previous to the invasion of the Cæsars. He tells us of their warlike courage and readiness to take ambush or to make a sudden onset, of their not being inferior to the Romans in weapons,

arms, and skill in encamping, embattling, and fortifying. "Their weapons," he remarks, "were a short spear and light target, a sword also worn by the side; they fought sometimes in chariots flanged at the axle with iron scythes; their bodies were for the most part naked, only painted in wood in sundry figures to seem terrible, as they thought, but if pinched by enemies, not nice of their painting, to run into bogs up to their necks, and there stay many days, holding in their mouths a certain morsel no bigger than a bean, to suffice hunger. Their towns and strongholds were spaces of ground fenced about with a ditch, and green trees felled overthwart each other, their buildings within were thatched houses for themselves and their cattle. In peace, the upland inhabitants, besides hunting, tended their flocks and herds, but with little skill of country affairs, the making of cheese they commonly knew not, wool and flax they spun not, gardenery and planting many of them knew not, clothing they had none but what the skins of beasts afforded them, and that not always, yet gallantry they had, painting their own skins with several porraitures of beasts, birds and flowers." Flax is now to be found growing wild in many parts of Great Britain, and we should suppose that in the time spoken of, some of this common, yet useful plant, would then be growing in large quantities, but our forefathers must not have known its value for clothing purposes, if they had, we surely should have found a trace of it in the shape of some clothing or other covering, as it was their common practice to bury their dead in the best garments they had, but we do not find any remains of fabrics of their weaving. Dr. Rock gives us an instance of the use of woollen stuffs in these dark ages, but they were not woven but plaited. He says, that while cutting through an early Celtic grave hill, they came upon a body which had been wrapped, as was shewn by the few unrotted shreds still cleaving to the bones, in a woollen shroud of coarse and loose fabric, wrought by the plaiting process without a loom. However, the Britons did not spend their time idly and in vain whilst occupied in the Roman workshops, and the example set by the Romans was not lost upon the brave and noble Britons; they soon set to work to copy the arts and handicrafts of their conquerors, and during the time of the occupation, they learnt the mysteries of weaving, also the culture of flax. During this period we have very little information as regards textiles. At a later time the Saxons reintroduced the manufacture of several kinds of woollen cloths, which were made chiefly for home and domestic purposes, and during this epoch the art of manufacturing cloth grew to considerable importance, and was recognised as one of the principal industries. Embroidery was introduced, and the ladies of this time also became noted for their skill in using many coloured silks, as well as threads of gold and silver, an article which became universally known as English work. They were taught the use of the spindle and distaff, and we read that Edward the Elder sent his son to school and his daughter to work wool. Again, the Saxons developed a national school of art, the original germs of which seem to have been brought from the North by the first Scotch and Irish missionaries, and from the South by the Roman evangelists.

(To be continued).

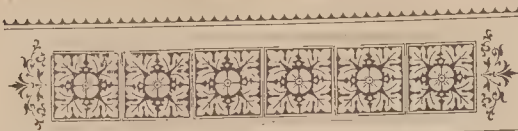
### Utilising Waste Coal.

The utilising of "waste" coal by the process of compression into "briquettes" has made great progress on the Continent, and this new industry appears to yield satisfactory profits. The machinery and methods employed in it are stated to have been greatly improved, and as there is ready sale for the product, large sums of money have been invested in the necessary plant. It is roughly estimated by Adolphe Gurit that the quantity of briquettes made by each of the chief coal producing countries of Europe last year was as follows:—

France .....	1,000,000	Tons.
Belgium .....	500,000	"
England .....	300,000	"
Austria .....	250,000	"
Italy .....	150,000	"
Spain, Germany, Russia, and Sweden .....	300,000	"
Total .....	2,500,000	"

It was in France that this industry originated, and it is perhaps natural, therefore, that at first it should there make the greatest progress. Considering, however, how enormously the out-put of coal in this country exceeds that of the entire European Continent, the conclusion seems irresistible that there is in Great Britain a very wide field for the spread of briquette manufacture. Referring to the general question of turning "small" coal to useful purposes, Mr. George André draws attention to a method of accomplishing this purpose which has been in successful operation in America for some time, and is about to be adopted by a large manufacturing firm in Germany. The coal is, first of all, reduced to fine dust, and in that state is blown into the furnace in which it is to be used. Apparently the object aimed at in this method is complete combustion.





### Cotton Charters. Weight and Measurement of Bales.

(From the "Liverpool Journal of Commerce," June 22nd, 1885).



THE new, or altered system of assessing the freight of cotton in the United States ports, does not appear to give satisfaction to shipowners. Freight is paid on the weight delivered in England; but the bales do not always correspond with bills of lading. Cotton pressed in wet weather, or exposed to the damp atmosphere after that process is accomplished, will absorb moisture; but during the passage to Liverpool evaporation takes place, and this lessens the gross weight of an entire cargo. That difference, however, is not very material when cotton is efficiently compressed by proper hydraulic machines. The cotton is not so compactly pressed now as it was when the work could be performed at the ports of shipment. To save cost on the carriage from the plantations to the coast, cotton is now packed and compressed at inland places, and then forwarded by railways to the shipping ports. Stevedores say they can stow as much measurement of this lightly compressed cotton as formerly, but not the same weight in a given space. What the shipowner wants is weight and not bulk. With light bales of cotton a ship must be ballasted with kentledge or stone, and this takes away capacity for the stowage of cargo, besides entailing expense. That, however, is not the worst feature of the case. Although the cubical contents of a given number of bales may represent so many feet, the measurement is not a fair measurement of the weight on comparison with the standard, which seems to be nearly displaced. The upshot is that a ship loses in freight in consequence of the lightness of the bales. By the old screw method of compression, and the fastening with rope or other substances, the expansion was considerable, but the hydraulic apparatus flattened the cotton and made it the consistency of wood. Iron bands, also, kept the bales from swelling to any considerable extent, and lessened the loss of carrying space. It is impossible, however, to compress cotton so compactly as to stop expansion. The increase in the dimensions of the best pressed bales is said to be from 1 to  $7\frac{1}{4}$  per cent.; but at the American ports the increase in size on the modern style is said to have exceeded this per centage in 1884. The additional handling of the bales, after they leave the compressors, must help to expand them. An experienced master states that the loss in weight (with no advance in freight), has been from 15 to almost 19 per cent. He filled the holds, saloon, cabins, part of a bunker, and piled bales on deck, but the total freight was below what the ship earned per voyage in 1883. As the remuneration paid to the shipowner for the conveyance of cotton is at per lb., irrespective of the room occupied by the bales, it seems that shipowners are doing business at a sacrifice, and wearing out their vessels without any prospect of replacement. They cannot afford to act in this patriotic manner, and, therefore, they should concert measures for raising the rates of freight or altering the standard. It has been suggested that ships chartered to convey cotton should be taken up by the register ton. When a vessel is hired at per ton, unpleasantness arises between the shipowner and the charterer. The stowage abilities of ships differ. The ton of register should be, and is, an approximate measure of capacity and burthen; but some ships will carry more than others per ton of register. A charterer who pays a lump sum for the use of a ship's stowage and carrying efficiency wishes to make the most out of his bargain, and he not unfrequently insists that goods shall be placed where a master insists they shall not, and hence disputes. A charterer is entitled to demand shipment for every ton of cargo a vessel can take on board and carry with safety. He is not, on the other hand, to act unreasonably, and by overloading a ship make her unseaworthy. If an arrangement could be arrived at whereby a

limit should be put to the ton of measurement or weight of cargo, the payment by the ton of register might be a means of solving the controversy; but the give-and-take principle must be largely exercised in settling cotton charters on this almost indefinable base. When freight was paid on bales by the scale of fifty cubic feet per ton, the shippers discovered that the weight was of no consequence to them. The shipowner, in order to earn more money, and to dispense with ballast, consented to pay for the charge of compressing, but having done this, he considered that the parity was sensibly altered, and that forty cubic feet should represent the ton of weight. At Bombay and Calcutta the Chambers of Commerce have been at variance with the shipowners, and there is a disposition at intervals to quarrel over this tonnage matter. When, therefore, there is an agreement to carry cotton by the ton calculated by measurement, the estimated loss by expansion can be accurately determined, for all practical purposes, by competent men, and an allowance made. In the shipping trade, however, there are ignorant managers, or owners, bent on obtaining employment for their vessels at any price, and these persons accept charters without possessing the slightest knowledge of particular freights. The owner with information at his command is brought down to the level of the impecunious class, or is made to suffer for the rashness of foolish competitors.

### The Tariffs of Austro-Hungary.

While Austro-Hungary and Germany are quarrelling over their trade, a chance may offer for Great Britain to step in and walk off with a part, at any rate, of the coveted morsel. Austria has determined to raise some of her Customs duties against German products to almost prohibitive rates, and Hungary will probably find it expedient to adopt the same course as her partner. From the Consular reports we find that Germany supplies about 70 per cent. of the imports of Austria-Hungary. From her the Austrians obtain wood, coal, and turf, joiners' and woodcarvers' work, corn, flour, fruits, plants; brown coal, cotton goods, flax, hemp, and jute goods, and woollen goods. Germany is also Austria's best purchaser; in fact in purchasing she takes double the amount of all other countries put together, and in selling, if we take the total of other sellers as one, she supplies one and three-quarters. Obviously, therefore, a war of tariffs between Germany and Austria-Hungary must mean the dislocation of a considerable amount of trade. In one of his reports Mr. Drummond says that "what English trade is with Austria no fellow can understand. Part passes into Austria and Hungary by the ports of Trieste and Fiume, part *in transitu* through Germany; and this fact must be taken into account when looking at the total amount given as imports from Germany, as a certain quantity are undoubtedly English goods." In the Board of Trade Returns, only the direct imports and exports are given, and of these the value fluctuates a good deal from year to year. In 1874, for instance, the exports from Austria-Hungary to Great Britain were £799,544 and the imports of British home produce into Austria £1,063,649. In 1883 the exports to Great Britain were £2,337,896, and the imports from this country to Austria £967,529. From these figures, making all allowance for indirect importation, it is clear that the trade between British manufacturers and Austria would stand improvement. The chief articles we get from Austria are corn and flour. The chief articles we send to her are cotton manufactures—£257,882 in 1883, and iron £99,960; besides jute manufactures, £88,867; machinery, £62,152; oil seed, £101,411; coals, £25,978; and woollen goods, £44,914. If British manufacturers take proper advantage of the opportunity that promises to present itself, some of these figures should be greatly enlarged. The new tariff, it is said, will bear hardest upon the cheap German goods manufactured expressly to compete with the better class of English wares, agricultural machinery, cutlery, hardware, fire-arms, cotton textures, linen cloths, perfumery, soap, and stationery. "The German goods," says the Vienna correspondent of the *Times*, "are often made to look as much like English articles as possible, English trade marks being closely copied in many cases to increase the value of the imitation, and the low prices of these wares naturally tempt buyers. But if, when the duty on German goods is increased, British manufacturers shipping directly to Trieste or Fiume can see their way to selling a little cheaper, the





LACE COUNTERPANE.





## ORIGINAL DESIGNS.

On our first page we give a design for a Lace Counterpane, which has been drawn by Mr. George Lees, Commercial Buildings, Kidderminster. This design consists of a fine ornamental formation, which will suggest itself for adaptation to other purposes besides that of a lace counterpane.

Our second page represents a design for a Printed Blind. It has been designed by Mr. J. L. Horner, 26, Cannon Street Manchester.

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The latest patterns of French and English Coatings, Vestings, Suitings, Fancy Cloths, Cassimeres, Tweeds, Mantle Cloths, &c. These Patterns give the latest Designs and Colourings for Cloths for the Spring and Summer Seasons in 1886.

## 100 SAMPLES FOR £2. CARRIAGE PAID.

A remittance must accompany order, made payable to H. and R. T. Lord, the "Journal of Fabrics and Textile Industries." Office, 10, Ann Place, Bradford, England.



## MONTHLY TRADE REPORTS.

**Wool.**—The Colonial wool sales, held in London, have been characterized by a flat tone, the prices for most descriptions of wools ruling under those procurable at the last sales. A large proportion has been withdrawn, and will, consequently, be offered at the next series, which will commence on September 1st. In the Yorkshire districts, a fair quantity of wools has been sold, and prices have, on the whole, kept firm. There is abundance of wool in the market, and this fact has militated against sellers procuring higher prices, although holders in the country have been stiff in their quotations. The above applies also to the Scotch districts. In the yarn departments, spinners have been fairly well engaged on orders both for home and export, the demand being principally for coarse counts. The piece trade has not shown signs of much improvement, and although a considerable turnover has resulted during the month, it has been mostly of accumulated stock. This branch is in an unremunerative state.

**Cotton.**—The sales of the raw material have been steady, and prices have not shown much variation. In yarns, the month opened with stagnant markets, but they improved slightly towards the close, and a better feeling seems prevalent. Home buyers have only purchased for actual requirements, and any speculation entered into by them has been the exception. Exporters have operated to a rather large extent, but sales have generally been at fractionally lower rates to induce business. The cloth departments have shown signs of improvement, many branches experiencing a larger demand, and thus part of the surplus stocks has been cleared from the market. Prices have ruled steadier.

**Woollen.**—In the Leeds and Huddersfield districts, trade has been about the average, the finer makes of worsteds, both plain and fancy, taking the lead in the markets, the medium qualities coming in for a fair share of the demand. Fancy woollens have had to give way in a great measure to worsteds, which, for trouserings, are mostly of small patterns, both in

checks and stripes, whilst for coatings, plain twills and corkscrews lead the way. Cheap tweeds for the clothing trade still meet a fair sale, but in the matter of prices, they are cut exceedingly fine. In the Scotch districts, a fair amount of business has passed, and, as a rule, manufacturers keep tolerably well employed, and prospects seem hopeful. In the heavy woollen districts there are no new features, only a moderate business having been transacted.

**Linen.**—Quietness has prevailed in nearly all departments of the linen trade, reduced time and wages being much talked of. Some manufacturers are fully employed, but only on old orders, and new business of a remunerative character is difficult to procure. Jute goods are at a low ebb, and prices have been consequently affected, but, owing to running short time this may be improved shortly.

**Lace.**—Lace and hosiery orders have been placed sparingly, and at very low rates, and the general tone of these branches has been most unsatisfactory. Curtains have been produced in exceptional designs, but still the demand does not come near the supply. Manufacturers of nearly all descriptions of goods complain bitterly of the trade, and of the cloudy outlook for the future.

**Carpets.**—The carpet trade has been in a depressed condition. June is generally a month of dullness, but if there has been any difference, it has shown more than an average amount of stagnation. No sales of importance have taken place during the month, and the outlook seems gloomy. Stock-taking is, to a great extent, occupying the attention of manufacturers, many of whom are hoping that their balance will be on the right side. Many looms are engaged in pattern weaving for next season's goods.

## The Tariff on Wool.

The treasury officials of the United States, says "The Boston Journal of Commerce," have now under consideration the regulations and decisions relative to the duty on wool. According to a recent investigation, the reductions in the wool schedule have resulted in a much smaller loss to the revenue than has been claimed. The abuses in the matter of the wool tariff are charged not to the customs officials or to importers, but to the vacillating course and the conflicting decisions of the Treasury Department itself. It is charged that the law defining the classes of wool which are to be admitted for use in making carpets at a low rate of duty, and the classes adapted to other uses which are subject to higher rates of duty is sufficiently clear; yet the rulings of the treasury have been such as to make extensive frauds possible. Among other things it is said that alpaca, mohair, and other wools of the finer grades, are admitted in large quantities at the lower rates presented for the inferior grades of wool; that the provision of the law also, which permits the importation of "waste" at a merely nominal duty, has been so construed that large consignments of fine wools have been imported at a small percentage of the duty which the law, properly interpreted, imposes. The Secretary of the Treasury has had these allegations under consideration, and, if they are sustained, the decisions of the department will be revised. The change of practice which has been suggested is that, in assessing the duties upon wool hereafter, the appraising officers shall be directed to ascertain the quality, class, and value of the wool, irrespective of the statements of importers as to the objects for which the wool is designed. In other words, an appraiser, who is passing upon the finest quality of wool, is not to accept as an undisputed fact the statement of an importer, or a custom house broker, that the wool is intended solely for the manufacture of carpets.

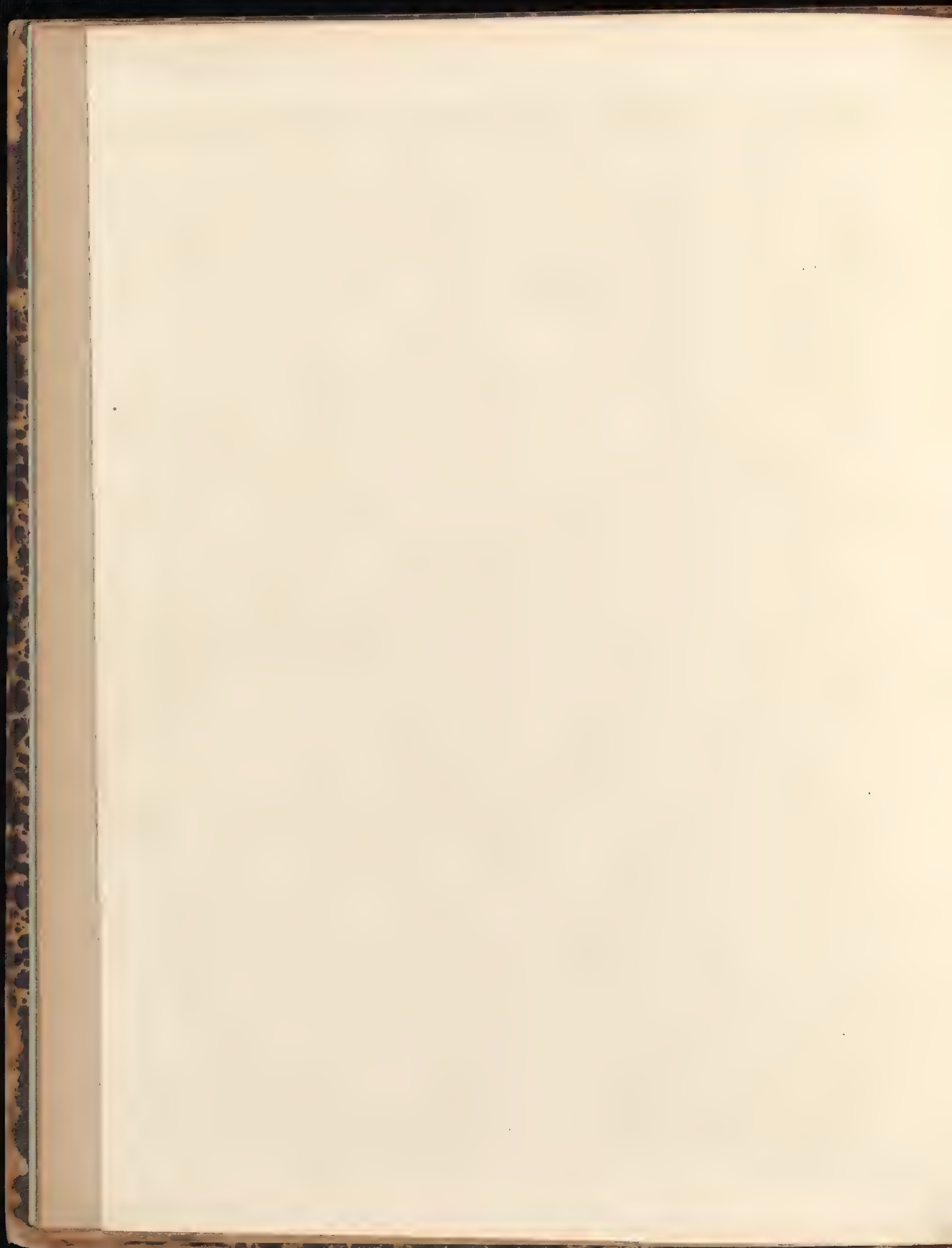
The *Daily Telegraph* says:—"We are informed that the Government contemplates the issue of a Royal Commission to inquire into the recent and present depression of trade. The Commission will be composed of representatives of every considerable industry and of every important branch of trade and commerce in these islands. The Cabinet have not absolutely come to the determination to take this step; but we are justified in stating that the matter has so far progressed that, should no unforeseen occurrence arise, the decision will be duly announced to Parliament. Of course the members of the Commission would be selected by the Government and recommended to the Queen for her approval. Their appointment would not in any way depend upon the judgment of Parliament."



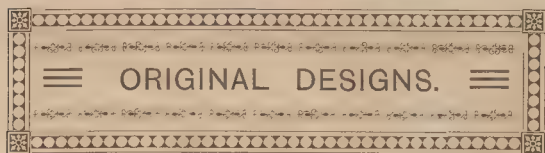


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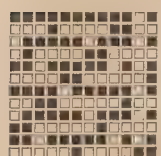


## Mantle Cloths.

Amongst the novelties in fabrics which some manufacturers are busily engaged upon for the winter season, there is a variety of mantle and Ulster cloths, in the making of which Kyrle (or curl) mohair yarns enter freely. The fabrics are also to be used as trimmings, and are intended to supplant astrachan and other materials now used for this purpose. We have several fine specimens of these fabrics before us, each one widely differing from the other in effect. The weight of the fabrics range from the heaviest to the lightest consistent with the season for which they are intended. The specimens number nine different effects. The first to which we draw attention is a single cloth having a curl yarn placed in the warp at equal distances. This produces a good cloth with a vertical stripe, and this stripe seems to be popular, as it appears under different applications in nearly all the samples before us. A second cloth is composed of a large curl with heavy woolly (mohair) back, another one of equal weight has a fine knopped vertical rib. Yet another one, even heavier than the two last named, has a fine surface composed of minute curls indiscriminately distributed over the face of the fabric. There are others with fine, medium, or coarse curls, with moderate and light backings, and one—a handsome cloth—has a plain, soft back, whilst the face has ribs of curled and knopped yarns running about half an inch apart. All these samples may be seen by those of our subscribers interested in mantle cloths, and who will do well to give these makes their attention. We also desire to recommend to their notice the designs for this class of goods which are given in this number. They may be taken as thoroughly reliable plans, as they have been specially worked out for us by a practical designer.

## Broad Striped Kyrle Mantle Cloth.

No. 281.



Design.\*

72 ends per inch.  
48 picks per inch.  
24's reed.  
3 ends in each split.  
60 inches wide in the loom.

Warp: 1 Kyrle or Spiral yarn 4's.  
11 Black cotton 2/50.

Weft: 7 skeins woollen.

## Kyrle Mantle Cloth.

No. 282.



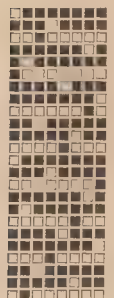
Design.\*

60 ends per inch.  
40 picks per inch.  
15's reed.  
4 ends in each split.  
3840 ends or 64 inches wide.

Warp: 2/40 Fast Black cotton.

Weft: 2's Spiral yarn.

No. 283.



Design.\*

## Striped Kyrle Mantle Cloth.

60 ends per inch.  
48 to 50 picks per inch  
30's reed.  
2 ends in each split.  
64 inches wide in the loom.  
52 inches wide when finished.

Warp: 1 Kyrle yarn 2's.  
7 Black cotton 2/40.

8

Weft: 6 skeins woollen.

All these cloths are to be piece dyed to shades required, such as Black, Brown, Olive, Dark Bottle Green, etc.

## Present Season Cheviots.

No. 284.

Warp:



Design.

1 Black, Steel Grey and Scarlet worsted twisted to Black woollen. 10 skeins when twisted.  
3 Black self twist. " " "  
1 Crimson, Green & Orange worsted. " " "  
3 Brown self twist.

Weft: 1 Blue, Orange & Scarlet worsted. 10 skeins when twisted.  
4 Black self twist. " " "  
1 Crimson, Green and Orange. " " "  
4 Black self twist.

No. 285.

Warp:



Design.\*

2 Black and White woollen twisted to Crimson worsted.  
2 Black self twist.  
2 Black and White woollen " Green "  
2 Black self twist.

Weft: 1 Black woollen twisted to Tan and Black.  
3 " " "  
1 " " " Scarlet and Black.  
3 Brown "

No. 286.

Warp:



Design.\*

1 Black and Orange and Green.  
1 Brown and White.  
2 Black.  
1 Black and Crimson and Yellow.  
1 Brown and Whits.  
2 Black.

Weft: 1 Black and Crimson and Black.  
2 Black.  
3 Brown.  
1 Black and Green and Black.  
2 Black.  
3 Brown.

No. 287.

Warp and Weft:



Design.\*

1 Black twisted to Tan and Black. 10 skeins.  
3 " self twist. " "  
1 " twisted to Crimson and Black. " "  
3 Brown self twist.

24 picks per inch.  
28 ends "  
7's reed.  
4 ends in each split.  
63 inches wide.

No. 288.

Warp:



Design.\*

1 Black twisted to Black Crimson. 10 skeins.  
4 Self Brown twist. " "  
1 Black twist to Black and Green. " "  
4 Self Brown twist. " "

Weft: 1 Black twisted to Tan and Black. 10 skeins.  
3 " self twist. " "  
1 " twisted to Crimson & Black " "  
3 Brown self twist.

No. 289.

Warp and weft:



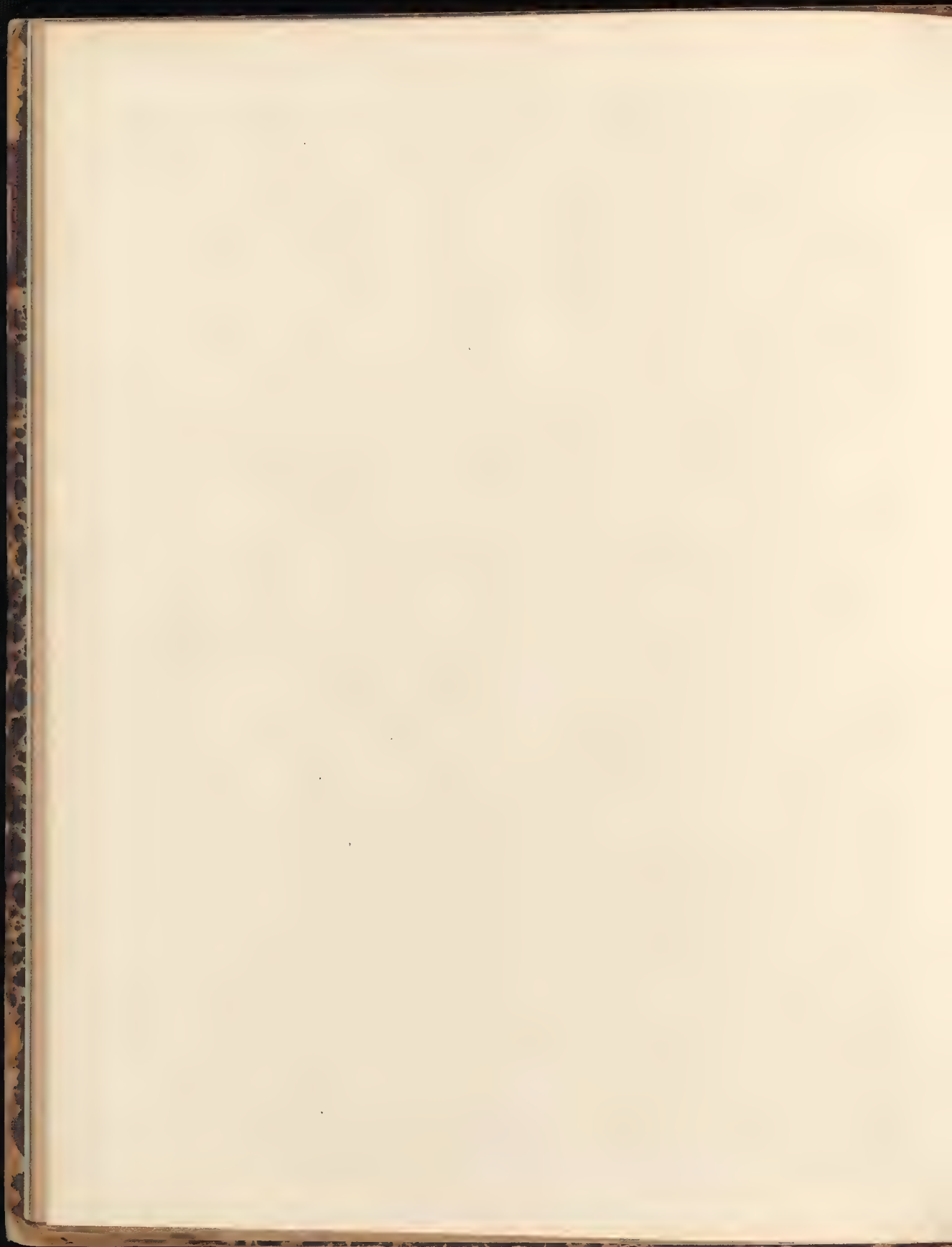
Design.\*

1 Crimson, Green and Orange worsted twisted to Black woollen. 10 skeins when twisted.  
4 Self Brown twist. " " "  
1 Black, Crimson and Green worsted twisted to Black woollen. 10 skeins when twisted.  
4 Self Black twist.

All the above Cheviots are in one sett in the loom, and are from one quality and length of yarn.

To test the purity of olive oil, take three parts of pure nitric acid at 40°, with one part of distilled water. Mix three grains of the substance obtained with an equal weight of the oil to be tested, the whole being heated in a water bath. If the oil is pure the colour gets paler and clearer, but remains yellow; if seed oil, especially cotton, should be present, the oil would be reddish, although clear.









## MACHINERY, TOOLS, &c.

### Central Rack Rising Top Saw Bench.

A very simple, but most compact, top saw bench has been produced by Messrs. Yates and Smith of Northgate Works, Halifax. Many of our large manufacturers use such machines in their mechanics' shops, and, therefore, a description of this saw bench will be of interest to them. There is only one central rack, also one wheel casting at each end, and, instead of the usual small slides and racks, and complements of wheels and pinions, the slide is made in one casting, nearly approaching the arch form. This slide is almost the width of the bench itself, and on it is cast the broad central rack, which is capable of lifting four times its load. The raising of this slide, and with it the bench top, is effected in a very simple manner. The wormwheel and pinion are in one casting, and revolve loose on the short cross-shaft, which is a fixture carried in two brackets, cast, as shown, on the end of the bench. The same description of slide and motion applies to the opposite end of the bench, and both ends are worked simultaneously by the hand wheel and worm shaft, which traverse the whole length of the bench, and are carried by bearings cast on each end. With the simplifying of the working parts one important advantage is gained—the liability to breakdowns, owing to the choking up with sawdust, is very considerably minimised; and with the slide in one piece, and a strong rack cast on, increased rigidity is given to the bench. The worm wheel and pinion being cast in one also dispenses with any necessity for fastening, and simply revolve loose, whilst the compactness thus secured reduces the length of the cross-shaft one half. The worm at each end of the bench, after being adjusted in position, and held by set-screw, is bored right through its boss and the shaft that carries it, and a steel pin is fitted in. The fence is made adjustable by a hand-wheel, to set at a bevel, and to swing over the end for cross cutting. The machine is provided with fast and loose pulleys, so that it is entirely under control. The saw spindle is made of good diameter, bored to the end to receive the auger, and is fitted with two adjustable lock-nuts, to take up all side play in the neck nearest the saw. The advantage claimed for a rising top bench, is that the spindle and belt do not move, whilst, with a rising spindle bench, the belt is never at one tension, consequently, the work got out of the machine in a given time must necessarily vary in proportion as the belt varies in tension. Messrs. Yates and Smith, who have patented this machine, have already taken numerous orders for their improved saw bench, which seems to give general satisfaction.

### A New or Improved Apparatus for and Method of Chemically Treating Wool, Cotton, and other Soft Goods.

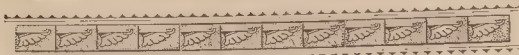
This invention, for which a patent has been granted, relates to the chemical treatment, *i.e.* the dyeing, bleaching, washing, mordanting, steaming, oxydizing and drying of wool, cotton, and other fibrous materials in the form of slubbing, rovings or slivers, and it substantially consists in placing the said material in coils around a perforated pipe, and in forcing or drawing the operating fluid through the pipe and its perforations, and through the material; a moveable head or cap being placed on the top, or end, of the said pipe, adapted to close, or cover, the perforations of the same which are uncovered by material. The apparatus consists of a reservoir for the fluid, a pump, and a receptacle in which the material is treated. The pipes for the circulation of the fluid are led into the bottom of this receptacle, into which perpendicular pipes with perforated sides are inserted. Bobbins or reels containing the fibres or fabrics to be operated upon are placed on these pipes and a small disc is placed between and close to each. These pipes are all joined to one main pipe which is connected to the pump and the reservoir and is also connected to the receptacle by a return pipe. When the bobbins or reels are in their places, the fluid is turned on, and soon fills the circulating pipes that pass through the perforated pipes and the bobbins, with the material thereon, till the fluid finds its level. The stop cock is then reversed, shutting off the flow, and the pump, by means of a suction pipe, returns the fluid to the reservoir. This action begins as soon as the fluid reaches the lower end of the suction pipe, but can be reversed by drawing it through the material and the circulating pipes through which it entered. The pump can be used as a force pump to press the fluid, but the suction gives better results. The perforated pipes are covered or closed at the top by moveable caps, and the perforations are larger at the bottom than at the top. The fluid to be employed varies according to the nature of the effect to be produced. In case the material is to be dried, the pipes with the coils on them are placed in a heated chamber, and the lower ends of the same are connected with an air-exhauster.

## Mordants.

(Continued from Page 70).

The compounds of iron are more suitable for cotton and silk dyeing than for wool. They are used in the production of the darker shades—blacks, browns, certain blues and violets, chocolates, &c. Acetate of iron, known also as Black Liquor, Black Mordant and Pyrolignite of iron, is the iron mordant most commonly used in printing. It consists of protoxide of iron in combination with, and kept in solution by, crude wood-vinegar or pyroligneous acid. It is sold of different strengths, varying from 10° to 28° Tw. It is of an olive colour, but when in large quantities it appears black, it has a tar-like smell, and an inky taste. It is prepared by two methods; the most common way is to permit crude acetic acid to stand in large casks or tanks on scrap iron, and to run from one tank to another until it has dissolved all the iron that it can take up; or it is prepared by mixing a solution of copperas with a solution of acetate of lime, or of brown sugar of lead, and after allowing the mixture to settle, drawing off for future use. Pure acid, or pure soluble acetates do not give as good a quality of black mordant as that containing a certain quantity of tarry impurities. A per-acetate of iron has been proposed as preferable to nitrate, but it has not come into practical use. In order to find if black liquor is genuine, add a little nitric acid, and then apply heat to per-oxidize the iron, next add an excess of ammonia, and filter off the precipitate; the clear liquid left must be evaporated to dryness and the remainder heated. Nothing ought to remain but a trace of carbon, resulting from tarry matter, unless common salt has been used to increase the Twaddle, when it will be found as a white mass. Black Iron, used with madder (alizarine), produces colours varying from purple to black; mixed with red liquor, in various proportions, and alizarine, shades of chocolate are produced. It is also used with other dyewares. Some practical men have recommended the use of hyposulphite of iron, and the pyrophosphate of iron, dissolved in ammonia, as substitutes for pyrolignite of iron; the pyrophosphate is said to produce very beautiful lilacs and purples, but these mordants have not come into general use. Copperas, Green Vitriol, Green Copperas, Protosulphate of Iron or Ferrous Sulphate, is generally prepared from the soft white variety of iron pyrites, often found to a great extent in coal deposits. These, on exposure to air and moisture, decompose the latter, taking up oxygen, and are thus changed into sulphate of iron. Should there be generated from the mineral more sulphuric acid than the iron is capable of saturating, some iron scrap is added to the liquid, which drains from the pyrites-beds. Copperas occurs in the form of pale, greenish-blue, semi-transparent crystals, containing 45 per cent. of water and 25 per cent. of protoxide of iron. If carefully heated, the water is expelled, and a white powder remains. The crystals dissolve in one and a half times their weight of cold, and in one-third their weight of boiling, water. On long exposure to damp air, they become covered with a brown, rusty coating, owing to the formation of sesquioxide of iron. Copperas should be chosen dry, hard, and clean, and of a decided green colour. If it is sticky to the touch, and of a dull, greyish or whitish green, or, as it is called in the trade, milky, it owes these characteristics probably to the presence of sulphate of alumina, which is often found contaminating the crystals when bad pyrites have been used, or when the copperas has been crystallised from too strong a solution. This impurity may be detected by boiling a small quantity with pure nitric acid, adding pure caustic soda (that prepared from metallic sodium to be preferred) in large excess, boiling in a clean iron vessel and filtering, adding to the clear liquid a solution of pure sal-ammoniac—if, after standing, a white sediment appear, alumina was mixed with the copperas. As many users of green vitriol prefer that having a dead, *i.e.* a neutral appearance, lime is sometimes dusted over the heaps by fraudulent dealers, or the same end is attained by sprinkling them with stale urine. To detect the impurities resulting from these practices, dissolve a portion; add an excess of ammonia, which must be free from carbonic acid, to the solution, allow the mixture to stand in a glass jar with ground edges, which should be greased a little and covered with a glass plate in order to keep out the air; when the precipitate has fallen, pour off a part of the clear liquid into a test glass, and add a solution of oxalic acid





### The Rhenish Silk Industry.

An interesting account of the condition of the Lower Rhenish silk and velvet industry, published by the *Frankfurter Zeitung*, states that business in velvets has recently grown more healthy in this respect, that manufacturers have applied their steam-power looms to the production of more remunerative articles instead of the cheap stuffs formerly manufactured. Lustre plush has thus been specially favoured, one firm being so fully engaged up to October next, that it has been compelled to decline extensive orders for earlier delivery. A considerable trade has also sprung up in striped goods, for which large contracts have been received from abroad as well as from home. This article is extensively used for trimming purposes in the better qualities of black and colours, and is being equally favoured with plush by the wholesale buyers. Plush, it may be added, is being manufactured in other qualities for portfolios and furniture. Everything indicates that "velvety" goods will be in fashion again in winter, and it is to be regretted that many manufacturers, in view of the unfavourable prospects during the spring, have accepted considerable orders for plush at unremunerative rates; those wholesale houses that recently quoted plush at ridiculously low rates are in many cases obliged to buy in now at an advance of 15 to 20 per cent. Stocks have been prudently kept low, and the time for abnormally reduced prices appears to have passed. The house weaving industry has improved so much that very few velvet handlooms are now standing still. The notion that cheap velvets of cheap qualities—as, for instance, of 800 nap,—are crowded out by good machine-made goods is a mistaken one, for the latter still require a great deal of improvement before they can offer formidable competition to the hand-made goods, whose regularity remains unequalled. Smooth velvets appear to be reviving, and continued orders are received for fashioned velvets (hand-made). On the whole, the velvet industry is in a decidedly better condition than it was a few months ago. The same cannot be said of the stuff trade, when the continued unpopularity of pure silk dresses is causing business to be very restricted. No other branch of the textile industries has gone through such a trial in recent times as the Rhenish silk industry, and a return to the fashion would find the trade ready and fit for anything. In the present many-sided state of the trade it is difficult to give anything like a reliable picture of its condition. Goods dyed in the piece give employment to several mills. Another article favoured by the spring demand—*faïlle française*—has also given rise to extensive orders for the autumn. In other goods used for dress embroidery—such as damasked, striped, and pointed stuff—orders are being received, but pure silk dress goods are much to be desired. No generally prevailing fashion has yet declared itself for mantle stuff. Pure silk French *moirés*, which at least in black are better made at Crefeld than at Lyons, are being manufactured by some new firms for underclothing. Coloured *moirés* have hitherto been derived from Switzerland, but these are being admirably prepared by the German dyers. In the finishing of semi-silk dress stuffs, the Crefeld manufacturers had fully maintained the competition with their French rivals.

### Plushes.

A considerable trade is expected to be transacted in the new plushes, which were first introduced to the public to any extent in the made-up form in that of long jackets. They present a brilliant and elegant appearance, and are pretty sure to be taken up freely. As a spring garment—except in the very earliest portion—they were inappropriate, the fabric being too warm-looking and thick. But with autumn days, tempered with a few degrees of lower temperature, they will be pronounced the exact thing, being warm and comfortable, while it is scarcely possible to have a handsomer or even more resplendent garment than these plushes make, and a successful run may be safely predicted for them during the coming season. Already, some good orders have been given for them by those who have pinned their faith upon the article and the judgment which has thus been formed.

### Given the Run and Number of Yards to Find the Weight of Yarn.

RULE.—Divide the yards of yarn by the number opposite the run that the yarn belongs to, and the answer will be in ounces; add a cipher to the remainder and divide again, and tenth parts of an ounce will be obtained.

Run.	Number to Divide by.	Run.	Number to Divide by.	Run.	Number to Divide by.	Run.	Number to Divide by.
1	100	4	400	7	700	10	1000
1½	125	4½	425	7½	725	10½	1025
1¾	150	4¾	450	7¾	750	10¾	1050
1⅞	175	4⅞	475	7⅞	775	10⅞	1075
2	200	5	500	8	800	11	1100
2½	225	5½	525	8½	825	11½	1125
2¾	250	5¾	550	8¾	850	11¾	1150
2⅞	275	5⅞	575	8⅞	875	11⅞	1175
3	300	6	600	9	900	12	1200
3½	325	6½	625	9½	925	12½	1225
3¾	350	6¾	650	9¾	950	12¾	1250
3⅞	375	6⅞	675	9⅞	975	12⅞	1275

EXAMPLE.—If there are 3,100 threads in a warp of 4 run yarn, what will be the weight of warp in a yard of cloth? 3,100 divided by 400 gives 7 ounces and 300 of a remainder; add a cipher to the remainder and divide again and 7-tenths of an ounce will be obtained.—*Wade's Fibre and Fabric.*

### The Lyons Silk Trade.

The crisis in the Lyons silk trade is discussed at length by M. Paul Leroy-Beaulieu in the current number of the *Economiste Français*. The circumstances of the traditional industry of Lyons are, he points out, in several respects peculiar. The so-called "manufacturers" are really merchants. They obtain the orders for goods and then employ the master workmen. The latter run their own looms in their own dwellings, employing from one to four assistants. Thus the operatives really occupy the ideal position which many theorists would regard as the most natural and dignified for the workman to fill. They are practically their own masters, and own the appliances of their labour, the capitalist merely supplying the raw material, indicating the way in which it is to be worked up, and paying the price bargained for with the operative. Nevertheless the Lyons operatives, like those of industries in which the capitalists provide all, are complaining of the lowness of their remuneration, and M. Leroy-Beaulieu is obliged to admit that their complaints are unfortunately at the present time only too well founded. Their employers, on the other hand, declare with equal justice that to pay higher rates, or to enact a fixed general scale of remuneration under existing conditions would have the effect of driving the trade from Lyons. One cause of this adverse condition of affairs is the tendency of Democratic institutions to promote the consumption of the cheaper classes of fabrics in preference to the sumptuous goods on which the reputation of Lyons is based. Even amongst the higher classes of society goods of mediocre quality, which have merely the appearance of richness and beauty, have more and more displaced the more costly hand-loom fabrics. Another cause is the growing taste for plain fabrics, which can be produced by machinery. Even in the suburbs of Lyons, as well as in the neighbouring departments, large silk-weaving mills have been erected, and the weavers of the city of Lyons are finding themselves in a position somewhat similar to that of the old hand-loom weavers of the cotton trade when competing fifty years ago against power-looms. The positions are not quite analogous, as in the manipulation of silk the superior ability and taste and the variety of the productions of the hand-loom weaver still count for something in his competition against power-loom producers. Nevertheless, his trade has undoubtedly suffered. Efforts have been made by some of the weavers to apply small motors to their three or four looms, but hitherto, from one cause or another, without success. Meanwhile Italy and Germany and even Russia and America, have made great progress in the production of silk goods. Finally, the French Customs laws and those of most other nations have had an extremely perturbing influence on the course of trade. Not only are Lyons manufacturers met by protective tariffs abroad, but the cost of cotton yarns are enhanced to the Lyons weavers by the French duties. The declared value of the exports of the silk goods from France has steadily declined from £17,500,000, in round figures, in 1873 to £10,500,000 last year. This decline is of course to a large extent due to the decline in the price of the raw material; but there has also been a decline in the value of the labour represented by the finished fabric. Meanwhile the Lyons producers do not appear to have obtained compensation in the home markets, the imports of foreign silk tissues having rather tended to increase. The declared value of such imports in 1873, for instance, was £1,221,000, and last year it was £1,816,000. Owing to the decline in the rate of remuneration net earnings of the weavers of the city of Lyons (owning appliances of their industry) are about 1s. 8d. per day.



century, and yet there are vast countries, compared to which our own island is but a speck, that are absolutely without this efficacious means of communication and transit. Guaranteed loans for the construction of these, for canals, and for irrigation works might be provided for countries destitute of such resources. These are a few subjects to which attention might be directed. They will not command universal assent, but they will at least afford food for reflection and discussion. That time will be required to inaugurate any useful movement is all the more reason for at once setting about the formation of a strong public opinion. But it is surprising, after all, how little time suffices to work wonders. Curtailment of the hours of labour in production, which some advocate so pertinaciously, might afford temporary relief, but it is only a fitful remedy. To extend distribution is to effect a permanent cure, and even to afford nourishment to an increasing volume of trade."

## ODDS AND ENDS.

The *Nordbohmische Landwirth* calls attention to the fact that the hop is botanically classed with textile plants, and that it yields a fibre not unlike hemp or flax. The reason which has prevented the industrial utilisation of this circumstance has been the difficulty attending the removal of the fibre from its tough coating, this being a relatively simple matter with other textile plants. A method has been invented for accomplishing this object without difficulty. Opinions of the Press are divided as to the commercial value of this invention, some practical authorities having disapproved of the quality of the fibres produced.

The following awards have been made in Group 6 to English exhibitors of textile machinery at the New Orleans Exposition:—Dronsfield Bros., Oldham, medal of the second class for grinding machines; medal of first class for card mounting machines. Goodbrand and Holland, Manchester, medal of first class for full set of yarn testing machinery. Lord Bros., Todmorden, medal of first class for cotton opener; medal of first class for cotton lapper. George Keighley, Burnley, medal of first class for looms. Samuel Brooks, Manchester, medal of second class for "Hill and Brown" patent spooler. R. and C. Goldthorp, Cleckheaton, honourable mention for samples of card clothing. J. Walton and Sons, Denton, medal of second class for card clothing for cotton. William Ryder, Bolton, honourable mention for spindles and flyers. John Mason, Rochdale, medal of first class for cards and drawing frames.

At the meeting of the Leeds Chamber of Commerce, the recent case, so important to the cloth trade, of *Drummond v. Van Ingen*, was mentioned, and the following resolution unanimously adopted:—"That this council, while not desiring to express any opinion on the merits of the particular case of *Drummond v. Van Ingen*, wish to record their conviction that the rulings of the Judge therein go far beyond their intended application, and by a totally new definition of commercial law, create in terms too comprehensive and elastic a precedent as to the warranty of textile fabrics that may hereafter be abused by incompetent or unscrupulous persons, and which in the interests of the trade of this district the council consequently regard with apprehension." Similar resolutions have been adopted by the Halifax, Bradford and other Chambers.

The *Elbeuf Jacquard* of the 30th ult., reviewing the condition of the French woollen industry, says that news from the interior indicates, on the whole, a more favourable state of affairs, the retail trade having apparently disposed of a greater quantity of summer goods than was anticipated. No perceptible modification is, however, reported in connection with the state of trade in the manufacturing centres, but in any case the new season's buyers were not to be expected until July. In the Eure district according to official reports, the woollen industry displays weakness. The current season does not seem likely to yield results as satisfactory as last year's; but manufacturers recognise that this fact is due solely to the temporary depreciation of carded wool, especially at Louviers, and this is not likely to have any influence upon the future, though for the present it has tended to reduce manufacturing activity. Steam-power weaving is, however, subject to more regular conditions. In the Marne district there has been no cessation of work lately, and manufacturers and dealers generally evince satisfaction at the state of affairs.

Statistics compiled by Mr. C. Gatenby, the Secretary of the Bradford Technical School, from a Blue Book just published, show that this college has obtained a higher Government grant than any similar institution in the kingdom. The figures, which deal only with the most successful institutions, are as follows:—

	Number under instruction.	Grant. £ s. d.
Technical College, Bradford	522	1138 8 0
Board Schools, Manchester	750	1049 12 0
Mechanics' Institute, Manchester	800	971 15 0
Anderson University, Glasgow	1376	934 1 0
St. Thomas's Charter House, London	700	851 5 6
Allen Glen's Institute, Glasgow	580	833 11 11
College of Science and Art, Glasgow	900	773 0 0
School of Science and Art, Bolton	650	698 0 0
Mechanics' Institute, Leeds	1020	688 2 0
Midland Institute, Birmingham	547	657 0 5
Working Men's Institute, Belfast	320	615 12 6
Liverpool Institute, Liverpool	550	615 0 0
School of Art, Glasgow	1060	605 0 3

## Postal Changes.

The following important changes came into operation on the 1st of July. The money order system is extended to the kingdom of Austro-Hungary, and also to Hawaii (Sandwich Islands). The rates of commission are identical with those chargeable for money orders issued on other foreign countries and on British Colonies. Parcels not exceeding 7 lbs. in weight are now received at any post-office in the United Kingdom for transmission to Aden, to any part of the continent of India, and to British Burmah. Parcel mails are made up in London for Aden, India, and British Burmah every Tuesday for despatch by the regular line of steamers sailing weekly from the Thames for Bombay, and parcels intended to be so sent must be posted in the metropolis generally not later than Monday night, and in the rest of the United Kingdom in time to reach London by the ordinary inland parcel mail service due there not later than Monday night in each week. As an exceptional arrangement, however, parcels may be posted at the General Post Office, London, between eight and ten a.m. on Tuesday morning. In the reverse direction, parcel mails from British Burmah, India, and Aden will be conveyed to this country by the steamers sailing from Bombay every Friday during the fair season and every Tuesday during the prevalence of the south-west monsoon. They will be brought to London, and the parcels will be distributed by means of the inland parcels post. The following are the rates of postage: For a parcel not exceeding 11 lbs. in weight, 1s.; for each pound or fraction of a pound additional, 1s. These rates carry the parcel to its destination without further postage. The rates of postage for heavy letters have been reduced. The scale of postage applicable to letters between 2 oz. and 12 oz. in weight is continued without limit. The letter postage, therefore, advances as follows:—For the first ounce, 1d.; for 2 ozs., 1½d.; for all greater weights, 1½d. for every 2 oz. plus a penny. Consequently letters weighing over 12 oz. are accepted at the following rates of postage:—Above 12 oz. but under 14 oz., 4½d.; above 14 oz. but under 16 oz., 5d.; above 16 oz. but under 18 oz., 5½d.; above 18 oz. but under 20 oz., 6d.; above 20 oz. but under 22 oz., 6½d.; above 22 oz. but under 24 oz., 7d.; and so on at the rate of ½d. for every 2 oz. Arrangements will shortly be made for the insurance of registered postal packets upon which the registration fee and postage have been prepaid, and also for the insurance of parcels. These arrangements, however, will take some time to carry out, and a further notice, giving full particulars, will be issued when a date has been fixed upon for their introduction.

## THE GAZETTE.

### Adjudications of Bankruptcy.

Barron, J. H. and G. Brumfitt (trading as Barron and Brumfitt), Albion Mills, Morley, Yorkshire, woollen manufacturers.  
Davies, J. M., Llanstephan, Carmarthenshire, woollen manufacturer.  
J. Leadbeater (trading as Leadbeater and Co.), Gillroyd Mills, Morley, Yorkshire, woollen manufacturer.

### Dividends.

Schofield, J. H. (separate estate), Bramhope, Otley, Yorkshire, woollen manufacturer, 20s., Official Receiver's Office, 22, Park Row, Leeds.

### Bills of Sale.

	£	s.	d.
Beswick, E., Hawthorn Grove, Heaton Moor, calico printer.			settlement in trust for wife.
Collins, J., Penhurst Road, South Hackney, floor cloth manufacturer.	80	0	0
J. Hyde, Hendham Vale, Manchester, cotton manufacturer.	38	10	0

### Dissolutions of Partnership.

Longfield, S., and Cauldwell, 3, Grainger Street, Newcastle-upon-Tyne, woollen warehousemen.  
Lodge, T., and W. Robinson, Bedford, lace merchants.  
Smithson, E., and H. J. Stocker, Batley, Yorkshire, woollen manufacturers.  
F. A. Saxton and H. F. Johnson, St. Mary's Gate, Nottingham, lace curtain manufacturer.  
J. F. Wilson, F. Wilson, G. Gilkes, A. Wilson, W. Wilson, T. C. Wilson, and T. Wilson, Kendal, woollen manufacturers.

## PATENTS.

### Applications for Letters Patent.

Actuating shuttle guards.	F. Waterhouse, London.	30th May 6,592
Attaching flyers to spindles for textile machinery.	F. W. Lawson and T. K. Hattersley, Leeds.	12th June 7,158



in distilled water; if any lime was present in the copperas, a white precipitate will be formed on standing for a few minutes. Copperas in its original state is much less serviceable now in dyeing than it was formerly, but it is used very largely for the manufacture of nitrate of iron (nitro-sulphate), and in the preparation of black liquor; it is also employed to a great extent in the cold vat for cottons. Dried copperas is used by some dyers under the name of calcined copperas. If it has been heated strongly enough to drive off both water and sulphuric acid, nothing can remain but peroxide of iron, which being insoluble in water will settle to the bottom of the tank without any action whatever. A persulphate of iron or red sulphate is sometimes used as a mordant. It is prepared generally by adding to a solution of copperas half as much sulphuric acid as it already contains, i.e. 18 per cent. oil of vitriol, and heating the mixture, adding, now and then, small quantities of nitric acid to peroxidize the iron. It is of a light, yellow colour. Muriate of iron (hydrous protochloride of iron or ferrous chloride) can be prepared by allowing common muriatic acid to dissolve as much scrap iron as it will take up. The clear liquid should then run off into bottles, well stoppered, as, if it be exposed to the air, it absorbs oxygen, and undergoes decomposition. It may be obtained by evaporation as greenish crystals, but it is generally used as a pale, greenish-yellow liquid marking about 80° Tw. Permuriate of iron, which is of little use as a mordant, is made by dissolving in muriatic acid, hydrated peroxide of iron, or scrap iron in a mixture of nitric and muriatic acids.

(To be continued.)

### Free Trade versus Protection in the United States.

It is interesting to note the various phases through which the protective policy of the United States is passing in the endeavour to bolster up a system which, its own friends being judges, is not found to be working out the advantage claimed for it. It being evident that a defensive line of action only results in lost ground, a policy of aggression is being vigorously urged by Protectionist organs generally. Such a course, indeed, is rendered imperative by the remarkable activity of the Free-traders, who are working with almost desperate resolution for their cause. In the face of a decided majority of Protectionists in both Houses of Legislature, the struggle of those who desire to see the country freed from the slavery of so-called Protection will be uphill work, but the American Free-trade League is in earnest, and is pursuing a vigorous propaganda. On the other hand, the Protectionist Association, called the Industrial League, has issued its manifesto, the object of which is to overcome the influence exerted by Free-trade journals and advocates. The protective interests are warned against remaining passive. Their policy, they are told, should be to strike for higher duties instead of simply resisting attacks upon the present tariff. Upon one point Protectionists are advised to bring strong pressure, namely, to secure the abolition of all the *ad-valorem* duties, and to substitute for them specific duties. To secure this end a special agitation has been got up in New York, which will have an important bearing upon certain trade interests. It is an agitation which, for certain reasons, will have the sympathy even of many English manufacturers who are not enamoured of the American policy of Protection. The agitation is aimed at a practice which in common parlance may be fairly denominated "sharp." Under the operation of the American tariff, as declared by Congress, certain duties, not needful to be specified, are leviable upon imported manufactured goods, but commercial ingenuity discovered a means of circumventing the intended operation of the duties. The process by which this is effected is simple. A foreign manufacturer doing business with the States sets up an agency in New York, to which all his goods are consigned, instead of to his customers or to American merchants. Thus an opportunity is given him of invoicing his goods at cost price, and of thus securing a decided advantage in the way of ultimate profit. This system is described as working injury in other directions; first, to the American Government, which loses the amount of duty leviable upon the goods; secondly, to the foreign importer, who invoices his goods at their saleable value; and thirdly, to the American manufacturer who is trying to conduct his operations under shelter of laws

which, in fact, do not shelter him. This system of evasion has been carried on to a great extent, especially by German importers, leading to investigations and to an increase in the valuation of hundreds of invoices. The Protectionist organs, however, contend that no thoroughly satisfactory repression of the custom alluded to can possibly be accomplished until the *ad-valorem* duties are removed, and specific duties imposed instead of them. Meanwhile the Philadelphia Textile Association has taken the matter up, and intends to spare neither time nor money to secure "a faithful execution of the Customs laws that pertain to textile fabrics and the materials which enter into their manufacture." Another indication of the commercial activity of the States is observable in the proposed reforms in the Consular service. It appears that the State Department is arranging to make the Consular service a little more effective as a means of obtaining commercial information. Whether this be a policy following the inauguration of the new President or dictated by the commercial interests, it is evidently intended to confer benefits upon local industries. The Consuls are to be required to obtain information upon all questions relative to all branches of textile manufacture in foreign countries, and, in reference to our own trade, their inquiries are to cover the "reeling and spinning of yarns, dyeing, winding, warping, weaving, finishing, materials and labour, mill expenses, machinery, &c." It is doubtful whether these instructions will lead to results that will be regarded as satisfactory. Consuls are not generally experts, and will be dependent upon what information they may obtain from those who have a practical knowledge and sense enough not to disclose trade secrets worth keeping. It goes for saying, too, that private enterprise, and not Official or State help, is alone to be trusted in establishing and maintaining any industry, and especially of textile manufactures. Another condition indispensable to the success of the Consular service as a commercial aid is that the service should have fixed tenure of office, and should not be dependent upon change of Administration, as is the case at present. The subject is interesting, and the experiment will doubtless be watched with interest on this side of the Atlantic.

### Production and Distribution.

The speech which Mr. Goschen recently delivered at Manchester, will have been noticed by most of our readers. The following remarks suggested by the address have been sent to the *Manchester Examiner*, by Mr. Thomas Newbigging:—"One expects to be met with the stock argument which has served its turn for long, that matters of commerce are best left to the enterprise of isolated traders; that, in short, the bulk of men must be content to fold their hands and wait on providence. But it is a foolish doctrine, who soever be the preacher. Whether the *laissez-faire* principle is the right one or not, the very fact that there are Chambers of Commerce in almost every important city and town in the kingdom, is a proof of the proved necessity for organised endeavour to spread information and concentrate effort in furtherance of the interests of trade. Direct Governmental interference is to be deprecated, as all advocates of free trade, from the very nature of their principles, admit, but that the formation of a robust and enlightened public opinion would give an impetus to improved methods and widened means of distribution can scarcely be gainsaid. The question has been put—"What then, can be done to promote this extended distribution?" Much might be done. Not to mention the reform of our home system of retail dealing—the fringe of which question Mr. Goschen only touched, though it is of transcendent importance, and for an able exposition of which readers may be recommended to a pamphlet written by Mr. Thomas Illingworth, of Bradford—I venture to enumerate a few matters that may well compel more attention than they receive. Chambers of Commerce might be made a hundred-fold more useful than they are. As a rule, they exhibit but a slumberous activity, as though a kind of lotus breath prevailed the air of their council halls, and clouded the deliberations of their members. Something surely might be done to clothe the dry bones with flesh, and infuse vigorous life into their organisation. The Manchester Chamber has lately begun to set an example of activity worthy of commendation. Governments should be influenced by public opinion to appoint properly-qualified Consular agents to the different foreign stations, with well-defined and enlarged instructions to supply information on the commercial resources and requirements of the respective countries. More attention ought to be devoted to Indian and Colonial questions both by members of the Legislature and others, and the hands of Ministers strengthened in the prosecution of a wise policy. More commercial men should be returned to Parliament, and the military and legal elements should be largely eliminated. Organisations might readily be established for opening up outlets for commerce in Africa, India, China, and other undeveloped or only partially developed countries. Encouragement and assistance might be systematically given to explorations by intrepid travellers and commercial missionaries. The enlightened example of the King of the Belgians might be followed with advantage. Support should be extended to national and local societies devoted to the spread of a knowledge of commercial geography. Railways are the great civilisers of the



# The Journal of Fabrics

AND

## Textile Industries.

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### Notices.

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The Proprietors will feel greatly obliged if any of their readers, in making enquiries of, or opening accounts with, Advertisers in this paper, will kindly mention the *Journal of Fabrics and Textile Industries* as the source from whence they obtained their information.



### Low Prices and Fair Prices.

THE following article, which appears in "The Bankers' Magazine" for July, is deserving the attention of all wise men and merchants. The writer says:—"By many it is maintained that low prices are the goal toward which we should always run. They believe that under such a condition our country would reap unparalleled prosperity. This is one reason why they are opposed to the present industrial policy, because the tendency of it is to maintain higher prices, and they would abolish it in order to bring in that much desired era. We are unable to assent to this doctrine that prosperity and low prices are synonymous. If they were, why are they not prospering at the present time? Certainly prices are low enough to satisfy the worst bear, and yet all know that we are not living in prosperous times. Complainers abound everywhere. Nor are these confined simply to one class of people. But it so happens that every person living on this planet is a buyer or a seller. He has two faces or sides to him like the moon or a cheese; but these low-price people unfortunately never see but one. They contemplate the human race solely as buyers, and forget that

they are also sellers. We cannot buy unless we sell, and if we demand a low price in purchasing, we must also expect a low price in selling. Now, this is only another way of stating the fact that prosperity is synonymous not with low prices, but with fair ones. We are all anxious to buy at the lowest prices and to sell at the highest, but this cannot be done. We cannot take advantage of one another universally in that way. If we attempt this, we shall miserably fail. Perhaps, as striking an effect of low prices at present as could be mentioned are the freight changes on our principal railroads. Some of these lines which had for years paid dividends with the utmost regularity are on the brink of bankruptcy. Who are gainers by such a change? Certainly not that large class who depended on such roads for regular dividends. Certainly not that large class who find their wages reduced in consequence. Nor are shippers, for they frankly say that they do not complain so much of the low rates as of the unequal ones which have been prevailing of late. Now, when a man sells a thing for less than it costs him, that loss is taken either from his capital, or, what is true in many cases, from that of the persons of whom he originally purchased: hence the enormous bankruptcies of which we hear from day to day. It is a long and doleful list. These bankruptcies mean that people have been selling without a profit, and using up the capital of others besides their own. The consumer may rejoice over his cheap purchases perhaps, but he does not think that someone else was paying a portion of the purchase for him. Perhaps he did not care, but such was the case. We do not believe that in a healthy condition of society such a state of things will exist. When times are truly prosperous, people will get fair prices all around, and this is the test of truly solid civilization. If they become too low, then losses and bankruptcy arise, from which society in the end is generally the loser. It may be mentioned in this connection that low prices are not always a good thing, or can be considered as low when they are the result of enormous combinations of capital and great manufactories and very small rewards for labour. It is a deplorable state of things when a few make all the money, and the great majority of people suffer. When we turn to our census and read of the enormous accumulation of wealth and the comparatively small number of persons who enjoy that wealth, we are inevitably led to exclaim, there is something wrong in our civilization. Great wealth and great poverty do not harmonize. And it requires but little study to find out precisely what change has occurred in society, what has happened whereby a few, either legally or illegally, or in some cases by accident, have become enormously rich. In the case of the great factories, products are often sold low, and we are asked, is not this a gain to society? But here we must interpose. Supposing the products are sold low, the aggregate sales enormous, and the owners become immensely rich out of the enterprise, then it is certain beyond all question that they have not divided fairly with their employees. Low as the product may be to the consumer, the division of the profits has not been the best for society. The recent great fortunes testify to the unequal distribution of the wealth of the community. This thing, or that thing, or the other, may seem to be low, but when its price is considered with relation to that obtained for other things, it is not so low, it may be, in fact, very high. One of the reasons why these hard times continue is the misadjustment of prices. It is true, looking at the subject in a general way, prices are more equal than they used to be. This is due to our postal facilities and telegraph. Some of the exchanges are trying to prove that this equality is due to their high-toned operations; but we are very certain that their position is erroneous. In the olden times great fortunes were made from uncertainties that do not now exist. All the business of the country is more equally divided on the same plane than formerly. The ocean telegraph did much to equalize prices and destroy the advantage which men formerly possessed. When we firmly get hold of the idea that we are both producers and consumers, and we should seek to get and maintain fair prices instead of very low or very high ones, we shall be far on the way for preparing a remedy that will end the existing business depression.

The Article on "Ornamentation of Fabrics" is held over this month.



Actuating the dabbing-brushes of combing machines. J. D. Black, Bradford. 25th June 7,719

Belting or endless band or chain driving apparatus. J. W. White, Liverpool. 2nd June 6,666

Breaking fibrous plants and separating out the fibres. M. Raabe and F. H. Zimmermann, London. 12th June 7,178

Belt fasteners. W. J. Brewer, London. 18th June 7,433

Buffer for looms, and step or bearing for shafting made from compressed buffalo hides. T. Westley and W. H. Bibby, Preston. 23rd June 7,609

Compound for cleansing wool and other fibres, cloth and other fabrics. J. Hanford, Halifax. 9th June 7,004

Carding engines. W. Dobson, Manchester. 10th June 7,068

Cutting fustians, velvets, &c. A. Sutcliffe, Rochdale. 10th June 7,069

Cloth for curtains, &c. R. C. Willey and W. A. Anderton, London. 13th June 7,219

Cutting and finishing pile and other woven fabrics. J. E. Bennett and J. Sternberg, London. 18th June 7,426

Carding or separating fibrous materials, chiefly cotton waste. W. R. Lake, London. 23rd June 7,650

Cutting or severing the pile of piled fabrics. J. Farran, Manchester. 24th June 7,662

Cleaning cards for carding fibres, &c. A. H. Clay, Halifax. 26th June 7,784

Driving Belts. J. C. Mewburn, London. 1st June 6,636

Driving gear and folding tables of machines for wringing and mangling fabrics. H. L. Wilson and J. Clegg, Halifax. 4th June 6,777

Dobbies or shedding motions. R. Eckroyd, London. 15th June 7,259

Dessicating animal and vegetable matter. B. L. Ryder, London. 16th June 7,352

Decorating wall hangings and fabrics. A. H. Reid, London. 17th June 7,382

Doubling or twisting yarns or threads. J. Farran, Halifax. 25th June 7,709

Designs on cloth, &c. H. J. P. Kirk, Halifax. 29th June 7,857

Embroidering machine. H. J. Haddan, London. 29th May 6,549

Extraction of sulphur from alkali waste, &c. E. W. Parnell and J. Simpson, Liverpool. 3rd June 6,715

Embroidering machines. E. Cornely, London. 5th June 6,877

English crape and like fabrics. B. J. B. Mills, London. 8th June 6,967

Extracting foreign matters from wool, &c. W. Spence, London. 18th June 7,418

Fixing colours on printed cotton fabrics, and for washing the same. W. R. Lake, London. 5th June 6,888

Finishing pile fabrics. S. C. Lister and J. Reixach, Bradford. 15th June 7,284

Fast pile fabrics and machinery therefor. S. C. Lister and J. Reixach, Bradford. 18th June 7,463

Finishing the edges of selvages of cotton, &c. B. Cooper and J. W. Ross, Manchester. 29th June 7,852

Guide-wires with twizzles for cap or flyer twisting, &c. H. Firth, Bradford. 4th June 6,771

Gassing yarns or threads. J. W. Dawson, London. 17th June 7,392

Jacquard improvements. J. Crabtree and J. Brearley, Halifax. 13th June 7,211

Knitted warp fabrics. H. B. Payne and W. Campion, London. 4th June 6,828

Looms. M. A. Furbush, C. H. Knowlton and B. F. Meyer, London. 29th May 6,553

Looms. M. A. Furbush, C. H. Knowlton and B. F. Meyer, London. 30th May 6,607

Letting-down motion for looms. E. Barlow, Manchester. 11th June 7,109

Lace curtains and window blinds. J. F. Forth, London. 15th June 7,266

Looms. S. Walker and G. Leek, Radcliffe. 16th June 7,305

Letting-off motion of looms. T. Watson and G. Kirk, Belfast. 17th June 7,368

Looms. W. L. Wise, London. 23rd June 7,646

Mottled yarns for worsted coatings, trouserings, mantle cloths, and dress goods. J. Dawson, London. 29th May 6,541

Milling woollen or other cloth, &c. J. Read, Leicester. 9th June 6,982

Making tufted fabric on sewing machines or by hand. A. M. F. Caspar, London. 29th June 7,859

Neckties, cuffs, &c. W. R. Lake, London. 8th June 6,968

Noble's combing machines. F. Unwin, London. 26th June 7,797

Opening and preparing cotton, &c. W. R. Lake, London. 10th June 7,094

Opening and cleaning cotton, &c. A. Ferguson and J. Elce, Manchester. 24th June 7,669

Pulleys for transmitting power. B. C. Tilghman and G. Richards, London. 29th May 6,532

Partitions between the caps or flyers of spinning or twisting frames. W. T. Garnett, Bradford. 4th June 6,773

Pickers for under-pick looms. C. Swindells, Halifax. 8th June 6,936

Purifying, bleaching, dyeing, or otherwise operating on yarns or threads. J. C. Mewburn, London. 12th June 7,187

Power looms for weaving figured pile fabrics face to face with two or more shuttles thrown simultaneously. S. C. Lister and J. Reixach, Bradford. 15th June 7,283

Pickers for looms. S. Mitchell, London. 18th June 7,424

Printing textile fabrics for cross stitch. H. Denk, London. 29th June 7,862

Picking motion of looms. K. Yates, Manchester. 25th June 7,723

Piece goods. E. H. Wade, Bradford. 26th June 7,766

Picking motion of underpick looms. T. Kershaw, Manchester. 27th June 7,811

Regulating the healds in looms. R. Ecroyd, London. 8th June 6,899

Ring spinning and doubling machines. G. Young, Manchester. 18th June 7,398

Reeds for looms. G. and E. Ashworth, Manchester. 20th June 7,519

Raising gigs for blankets, &c. J. Walker and T. G. Beaumont, Halifax. 26th June 7,769

Shawls, &c. J. T. Apperley, London. 30th May 6,590

Shuttle tongues. J. Waddington and J. Wilkinson, Bradford. 1st June 6,608

Shuttle guard and apparatus therefor for looms. R. Raper, Bradford. 4th June 6,772

Spinning and doubling frames. H. Ashworth and E. Eaves, London. 8th June 6,941

Spinning and twisting. A. M. Clark, London. 8th June 6,956

Slubbing, intermediate and roving frames for fibrous materials. S. A. Tuke, Rochdale. 9th June 6,986

Slubbing, roving, spinning and doubling cotton, &c. T. S. Whitworth, Manchester. 20th April 7,062

Shuttle guard for looms. A. Wilkinson and J. Shawcross, London. 11th June 7,138

Spinning and twisting frames. F. W. Lawson, Leeds. 12th June 7,159

Spindle tube for cap spinning, twisting or roving wool, &c. W. C. and J. Whitehead, Leicester. 12th June 7,173

Strap forks or belt guides, chiefly those used for looms and similar machinery. G. Greenwood, London. 15th June 7,271

Shuttles. W. Mitchell, London. 16th June 7,319

Shuttles. A. J. Boulton, London. 16th June 7,353

Stop motions, pin guards and pin rails of machines for beaming yarn. C. Catlow, Halifax. 17th June 7,361

Springs of shuttles. J. Whitaker, Ingrow. 18th June 7,404

Shedding motion for actuating healds. J. Clayton and T. Richmond, London. 22nd June 7,557

Size for spun cotton in spools, &c. J. F. Giraud, London. 24th June 7,072

Spinning or twisting yarns. W. Snowden, Leeds. 29th June 7,853

Treating fibres, yarns and textile fabrics. C. D. Abel, London. 30th May 6,593

Treating fibres for spinning. C. D. Abel, London. 30th May 6,594

Treating or utilizing soap suds. J. H. Ashwell, Liverpool. 2nd June 6,667

Treatment of fibrous substances for manufacture of textile fabrics, &c. R. C. Menzies, C. F. Cross, and E. J. Bevan, Liverpool. 5th June 6,840

Treating animal and vegetable fibres for textiles. W. W. Hamilton, New York. 8th June 6,922

Treating animal and vegetable fibres for textiles. W. W. Hamilton, New York. 8th June 6,923

Tying up the harness and coupling the uprights in a jacquard for weaving leno and gauze fabrics. M. Priestley, H. and R. T. Lord, and J. Thomis, Bradford. 11th June 7,102

Treatment of the matters separated or precipitated from the water in which wool, &c., has been boiled, scoured or washed with soap, &c. W. Jones and C. Kilpatrick, Manchester. 12th June 7,186

Tentering and finishing woven fabrics. D. P. Smith, London. 26th June 7,783

Tulle, &c. H. H. Lake, London. 29th June 7,889

Velveteens. W. E. B. Priestley and W. Bottomley, London. 13th June 7,221

Window blinds. W. P. Thompson, Liverpool. 1st June 6,613

Washing, scouring, dyeing, and stiffening woven or felted fabrics. E. Kempe, Leeds. 2nd June 6,668

Wool cleaning preparation. S. W. Maquay, London. 5th June 6,846

Weaving figured gauze and similar fabrics. A. Flather and S. Butterfield, Bradford. 5th June 6,854

Washing cloths, &c. J. Nicholas, London. 8th June 6,966

Winding bobbins for loom shuttles. W. Atkinson, London. 15th June 7,275

Weavers' harness and machinery therefor. J. W. Horrocks, London. 20th June 7,556

Weaving carpets and the like, and looms therefor. J. C. Mewburn, London. 23rd June 7,631

Woven fabrics. H. J. Haddan, London. 23rd June 7,644

Working or operating and levelling healds of looms. F. Leeming and R. Wilkinson, Halifax. 25th June 7,708

### Patents Scaled.

8,560	8,606	8,762	8,847	8,893	9,039	9,772
13,512	13,344	2,304	2,397	2,428	8,155	8,733
8,806	8,895	596	6,048	7,645	9,002	9,162
9,263	9,312	9,466	9,880	14,735	496	2,246
2,801	2,810	5,112	9,221	9,329	9,373	9,408
9,428	9,582	551	2,979	7,709	9,273	9,513
9,614	9,632	9,944	10,456	10,565	14,481	15,245
3,352	7,900	9,517	11,583	9,301	9,306	9,307
9,638	9,665	9,784	9,808	9,970	11,222	15,819
3,096	3,434	3,543	3,573	3,601	3,655	



may be said to a certain extent of the wild silks, but there are somewhat greater irregularities throughout the length of the cocoon in these silks than in the domesticated breeds. In Eria silk, the thickening of the fibres towards the centre of the cocoon is particularly noticeable, in Tussur silk, less so; but as only one cocoon has been examined, I do not insist that this exception is constant. There is no doubt that it is not difficult now to reel Tussur silk into very regular even threads. In 1876 I went to Italy, at the instance of the Government of India, to see if it were possible to make a good thread out of Tussur cocoons. I was perfectly successful, and the results may be seen at the India section of the South Kensington Museum, and will be found amply described in my "Handbook of the Wild Silks of India." Since that time a number of collaborators in India and China have been confirming these results. One gentleman in India, who has availed himself of the best European reeling appliances, has for some time regularly sent me samples of raw silk of his reeling, which have gradually become more and more satisfactory. He now writes, saying that there is nothing left to be desired, except to wait for more skill on the part of his young silk-workers; his observation is fully borne out in the opinions of several English silk manufacturers to whom I have submitted his results. The characteristic glittering appearance of Tussur silk when dyed, especially in black, is most probably owing to the fibres being flatfish, and the bave becoming separated into its ultimate fibres more easily than in mulberry silks, thus giving play to greater reflection of light. Owing to the extreme difficulty of obtaining transverse sections of the fibre of silk sufficiently thin, I have not yet been able to complete my investigations on its absolute structure, either in the undyed or dyed state. I am at present engaged on this, and hope before long to be able to describe the appearances, under the highest powers, of sections which must be as thin as, at least,  $\frac{1}{100}$  inch, in order that they may lie flat on the slide. The importance of this inquiry will be understood, when I state that to such an extent has the falsification of silk arrived by weighting with chemical matter, that in many fabrics the bulk is increased to as much as eight times the original bulk of the fibre. It will also be useful if we can get at a clearer idea as to how tinctorial matter, with and without mordants, permeates or penetrates the silk fibre, as well as to the action of certain matters with which silk has a peculiar affinity, as, for example, tannic acid, salts of tin, iron, chromium, &c.

### The Revival of British Industries.

We have before us a pamphlet written by a candidate for Parliamentary honours at the forthcoming general election. The writer treats upon the subject of the revival of trade. Without in any degree concurring with the views there set forth, it will be interesting to notice what are those views upon this most important subject. After expressing the opinion that the question of restoring prosperity to British industries should be made a test question at the general election, the writer says:—During the last twenty years the whole aspect of the Free Trade question has been completely changed by the development of manufacturing interests in foreign countries. In 1846, when the free trade question was so fully discussed, it was not unreasonable to suppose that England would become the great manufacturing centre of the whole world. Many of the countries that now make their own goods, were at that time entirely dependent on England for manufactured articles of iron, cotton, worsted, &c.; but within the last twenty years the United States, France, Germany, and other countries, have developed their resources to such an extent as to be able not only to manufacture for themselves articles for the supply of which they were entirely dependent upon England, but also to compete successfully with English manufacturers in the markets of Great Britain, Ireland, and the British possessions. There is sufficient skilled labour in Great Britain and Ireland to produce all the manufactured goods required in Great Britain, Ireland, and the British possessions, whilst in the Colonies there is every variety of climate, and the means of producing all the food required by our population. There is no reason therefore why we should submit to unfair tariffs imposed by foreign countries, the result of which is to injure British manufactures, and take away the means of living from our working classes. It is a mistake to suppose that if import duties were imposed on foreign manufactured goods, the prices paid by the consumer would be increased to the extent of the duties imposed. The competition between the factories at home would always keep down prices to the lowest level consistent with a fair profit to the manufacturer, whilst in many branches of trade, if full and constant employment could be ensured, both for the workpeople and the machinery, the cost of production would be materially reduced. The interests of the manufacturing and agricultural population are synonymous. The artisans when manufactures flourish are the best customers for every kind of farm produce, whilst a large portion of the money thus spent with the agriculturists, comes back to the manufacturers through the purchase of clothing, household furniture, agricultural implements, &c. But the result of admitting foreign manufactured goods free of duty has been a want of demand for labour, and that is undoubtedly one of the greatest misfortunes that can befall the working classes. The writer proposes to restore prosperity to our industries by imposing an *ad valorem* duty of 50 per cent. on manufactured goods coming from foreign countries, with a free list for articles of food, raw materials, works of art, &c. It is contended that as one-half, and often a still larger proportion, of the value of most manufactured goods is, in one way or another, represented by wages paid, an *ad valorem* duty of 50 per cent. would be the proper duty to impose. There is abundance of labour in England waiting for employment, and much of this labour remains

entirely unproductive when work is taken away and given to foreign manufacturers. If the foreign workpeople came over to England and worked in the factories here, they would at any rate be obliged to spend a large portion of their earnings in this country, and they would be upon an equal footing with our own artisans as regards the expenses of living and the hours of labour; but when the work is taken abroad to countries where living is cheaper than in England, and where there are no Factory Acts to limit the hours of labour, the competition is no longer a fair one. The result of imposing an *ad valorem* duty on foreign manufactured goods, would probably be that a large reduction would take place in the total amount imported. Articles of luxury, such as silks, gloves, fancy goods, &c., the demand for which is almost entirely confined to the wealthy classes, would still be largely supplied from France and other centres of taste and fashion, whereas, in articles manufactured from iron, wool, leather, &c., which could be made equally well in England, the quantity imported from abroad would at once be largely reduced. The revenue derived from the proposed duty would be a large one. The value of foreign manufactured goods imported into Great Britain and Ireland exceeded in 1884: £45,000,000, the 50 per cent. duty on one-third of this amount (supposing the other two-thirds £30,000,000 to be supplied from home manufacturers) would therefore amount to £7,500,000. Out of the revenue derived from the duty on foreign manufactured goods, it is proposed that a subsidy of one pound per acre should be paid each year on all the land in the United Kingdom which is sown with wheat. This is proposed to encourage the growth of wheat at home. The writer maintains that free trade might be at once established between England and India (India adopting the 50 per cent. duty against foreign manufactured goods). Canada, and some of the Australian Colonies, which rely to a large extent upon the customs duties for their revenues, might not be able to discontinue these duties against British goods at once, but even in these cases arrangements might be made for a differential duty, (say 10 per cent.) in favour of British manufactured goods; England and her colonies would then be bound together by the strongest of all ties, viz., the bonds of mutual interests, and in a short time the Empire would be formed into a Customs League or British Zollverein. The treaties concluded with foreign countries can nearly all be terminated with twelve months' notice, and none of these treaties limit us to tariffs, the only engagement being to give the most favoured nation treatment. Some of the advantages claimed by the adoption of these views are—the manufacturers would be kept fully employed by the enormous demand for manufactured goods. These goods would be required to replace a portion of the foreign manufactured goods now imported into Great Britain, to replace foreign manufactured goods now sent to India, and to replace those now sent to Canada, Australia, and other British possessions. The agriculturists would be benefited, and the working classes would find full employment in all kinds of labour, and the increased prosperity of the manufacturing and agricultural interests would be felt by all sections of the community.

### Toroto, a New Dyestuff.

M. Reimann describes in his *Faerber Zeitung*, a new colouring material which has been forwarded to him from Lower California. It comes from a shrub, known by the name of "Toroto," upon which the archil lichen (*arcella tinctoria*) is found, and which belongs to the family of papilionaceae, with feathery foliage, similar to that of "Robinia," (*Acacia*). The grey coloured bark gives a dark brown decoction containing a modification of tannic acid, which is not precipitated by antimony (tartar emetic;) but an abundant precipitate is obtained by a solution of glue. The bark is among the Indians used for tanning, giving the leather a handsome red brown colour. By the addition of antimony the decoction becomes red brown and darker; it becomes lighter and troubled by hydrochloric, or sulphuric acid. Alumina produces a precipitate of a dark drab colour; acetate of iron gives a black precipitate; chromate of potash has no effect upon the decoction. Chromic acid, however, and a mixture of chromate of potash and sulphuric acid, give a dark colouring. The dyestuff is easy to fix upon cotton, wool, and silk. With alumina mordant it gives a good drab, capable of considerable shading. For cotton, acetate of alumina was used; for wool, alum and tartar, each 3 per cent. of the weight of wool; for silk, simply alum and addition of soap to the dyebath. Iron gives with the toroto a dark grey colour. The cotton was mordanted with copperas and chalk, wool with copperas and tartar, 3 per cent. each of the weight of wool, and the decoction added to the bath. Reimann is of opinion, that the material will be valuable, if obtainable at a reasonable price, particularly for black upon cotton and wool, because it gives a very dark grey, which, with a little logwood, would probably give a good black. On account of its high percentage of tannin it would be likely to replace nutgalls and myrobalans in dyeing mixed woollens, particularly such as are fulled, doubles, etc.





### Researches on Silk Fibre.\*

**T**HE Chamber of Commerce of Lyons having done me the honour to request me to conduct an examination of the fibres of the various species and varieties of silk, both those obtained from domesticated worms and wild or semi-wild ones, on the basis of my former researches, partly described in my "Handbook of the Wild Silks of India," I have, for the past twelve months, given a more thorough examination of these fibres, from cocoons in my own possession, as well as from cocoons furnished to me by the Lyons Chamber, and Monsieur Rondot, an influential member of the Chamber, and ex-president of the silk section of the International Exhibition of Paris, 1878, whose able time and energies are given to the nurture and development of the French silk industry. The President of this important and influential Chamber, has in several letters to me expressed his high opinion of the value and importance of these continued investigations, the consequence of which is that, at Lyons, a laboratory is being constructed, called *Laboratoire de Sericulture*, and an earnest sericulturist, Monsieur Dusuzeau, has been appointed curator, whose office and work it will be to record the results of examinations of the various races of silk methodically and regularly. The effect of this annual and scientific work on the silk fibre will be to give, by a closer insight and more extended knowledge, a direction in the better reeling and sizing of silk, both European and Eastern, in the earlier stages of manufacture. The production of a thread of raw silk as regular and uniform as possible is still a desideratum, particularly in China, where the raws have mostly become very irregular and badly sized, probably through price, competition, and decrease of sufficiently skilled reeling labour. In India, too, there is great need of improvement and renewed stimulus in this respect; for although much was done years ago to improve the reeling of Bengal silks, the effort has not been continuous enough. Much remains to be done, for I think if India silk could be well reeled generally, it is from that continent we ought to look for a great supply. In the wild silks of India, it is simply the coming want, and the application of improved reeling appliances will mark a new era in the utilisation of Tussur and several other species of wild silks, a utilisation which is already one of the most remarkable facts in sericulture, and which may be said to take its date practically in 1878, when the amelioration and capabilities of these wild silks were first announced and shown by me in the Indian section of the Paris Exhibition of that year under the direct supervision of H.R.H. the Prince of Wales and of the energetic efforts of Sir Philip Cunliffe-Owen, with such success as gained from the jury the highest award—the diploma of honour for the Viceroy of India. It might be naturally enough supposed that in a continuous thread or bave of silk, as unwound from the cocoon, an absolute regularity of fibre would not be found; such is, indeed, the case, and my investigations have had for their objects the recording of these differences throughout the entire length of the cocoon thread, both as to diameter or thickness of fibre, strength, and tension, or elasticity of various species of silk, including the silk of commerce, produced by the *Bombyx mori*, or mulberry-fed worm, also various wild silks, and some spider silks. These points have been recorded at intervals of fifty metres. All species of silk worms have two stores of silk, one on each side of the alimentary canal; and below their mouths they have two so-called spinnerets or orifices, to which I have ventured to give the name of "seripositors," through which the silk issues simultaneously in pairs of fine parallel filaments or fibres, forming in fact a double thread. For all practical purposes I have considered it sufficient, in estimating the tensions, strengths, and diameters, to give those of this double thread; as in reeling the silk from the cocoons into skeins, it is, of course, invariably drawn off in the form of a double thread, although so fine is it as to be apparently one. The French term for this double thread is "bave," and each of the single fibres composing it is called "brin," which is synonymous with our word "fibre." The method by which I have reeled the bave or double thread from the cocoons is as follows: The cocoons were first softened by keeping them immersed for several hours in a dilute aqueous solution of Marseilles soap, which, before it was used, was examined and found to be free from any appreciable excess of alkali and then raising the temperature of this liquid for a few minutes to about 120 deg. F. When the cocoons were soft enough, the short or waste fibres were pulled off the outside of them until the end of the double reelable thread or bave was found. This was attached to the machine, and the thread reeled, the cocoon remaining floating on the surface of the soap solution in which it was softened until nothing was left, except an unwindable and extremely thin shell of silk immediately surrounding the chrysalis. The machine also registers the length of bave reeled. I have preferred to examine and to register the two fibres composing the bave conjointly because—1st. I thus get all the results which would be obtained by examining them singly, as whether the tension is estimated with either a single or double thread, the same mean or average must be obtained, and by finding the average strength and diameter of the double fibre, and dividing these by two, the average strength and diameter of the single fibre can be, of course, easily ascertained. 2nd. I find it somewhat difficult and very tedious to separate the two threads by any convenient solution, and I think there is risk of mechanical injury to the fibres, which would seriously affect the results. In estimating the tension of the bave, I cannot distinguish that

\* From a paper read before the Society of Arts by Mr. Thomas Wardle, F.C.S., F.G.S.

one fibre breaks before the other, but both appear to break at the same time, although the fibres of several species of wild silks being almost flat and joined together in pairs by their edges are not so strongly united as, and separate more easily than, the round fibres of mulberry silk; and, in estimating the tension of the bave of these silks, it must, of course, be first ascertained that the two fibres have not become separated. After each cocoon was reeled into a skein, I began to unwind the double thread from the machine, commencing at the inner end, that is, the end that was nearest the chrysalis, taking the first five metres for examination. I then unwound fifty metres, which I threw away, and took the next five metres for examination; and I went on thus until I arrived within five metres of the other or outer end of the reeled thread, which five metres I always examined, although the length of bave between this and the preceding five metres examined might be less than fifty metres. The bave, or double thread, of each cocoon was therefore tested for its strength, tension, and diameter at every fifty metres of its length, except at its outer end. Silk is well known to possess considerable elasticity. I have endeavoured to estimate this elasticity or tension by attaching three decimetres of the bave at a fixed point, on a scale divided into centimetres and millimetres, and then stretching it until it broke, and noting the point on the scale at which the breakage occurred. The strength of the bave was ascertained by a serimeter, contrived in a homely manner, consisting of a spring balance with a scale divided into drams and eighths of drams avoirdupois. Fifteen centimetres of the bave were attached to the balance arm and gradually pulled until breakage occurred, the point of its occurrence remaining registered on the scale of the balance. The diameter of the bave was measured under the microscope, with a power of 250 diameters, with the aid of an eyepiece micrometer, seven of the division on which represented  $\frac{1}{1000}$  inch. Between thirty and forty cocoons of different kinds formed the subject of this examination. Amongst the mulberry silks are several breeds or "races" from the various silkworm districts of the South of France, several from Japanese and Chinese seed but reared in France and Switzerland, also Italian and Grecian, as well as cocoons from Japan and China. The list also includes the following wild silks: The Indian *Tussur*, the Chinese *Pernyi*, the Japanese *Yamamai*, as well as *Muga* silk, *Attacus cynthia*, and *Attacus ricini* and *Lasiocampa otus*. Next in order is arranged a very interesting series of spider silks of the following species: 1. An Epeirid, *Nephilengis malabarensis* (Watch), an Indian spider sent to me for examination by Professor Thistlethorn Dyer. The following five have been sent to me by the eminent authority on spiders, the Rev. O. P. Cambridge, of Bloxworth Rectory, Wareham: 2. *Nephila plumipes* (Koch), United States, America. 3. Egg cocoons of an Epeirid sp. Adelsburg. 4. Silk from the nest of *Urotaea darandii* (Walck) from Palestine. 5. Egg cocoons of *Mata menardi* (Latr.) Devonshire. 6. Egg cocoons of *Vocania maculata* (Kays) N. Corrientes, La plata. 7. A supposed spider silk, dyed red in South America, lately sent to me for examination by Messrs. Marshall and French, of London. The results of Mr. Wardle's experiments having been given in tables, he says:—"First, as to the tension. It is clearly proved that the tension varies in proportion to the strength and thickness of the bave; being less at the thinner ends of the bave than at the thicker middle portions. In the *Bombyx mori* silks (the mulberry-fed worm silks), the difference in tension between the thinnest parts and the thickest is, in many cases 1.0 to 2.0 centimetres, and often more, in three decimetres of the bave, that is, a metre of the thinnest parts of the bave would stretch, say, 2.0 centimetres, whilst at the thickest parts it could be extended 15.0 to 18.0 centimetres, or more, before breaking; and the same proportion between tension and thickness obtains throughout the varying tension of the whole of the bave of each cocoon. The strength, as might be expected, varies in the same proportion as the tension, the thinnest parts of the bave, roughly speaking, breaking with a weight of 3 to 5 drams, and the thickest parts with a weight of 5 to 8 drams. Coming to the most important feature of the bave, it will be interesting to show in which way the thread varies in size or thickness, or, as I have previously termed it, diameter. The transverse section of the thinnest parts of the bave (the double thread be it remembered), again speaking roughly, measures  $\frac{1}{1000}$  inch to  $\frac{1}{1000}$  inch, whilst at the thickest parts its measurement is  $\frac{1}{1000}$  inch to  $\frac{1}{1000}$  inch. The six or eight trials along the entire length of the cocoon thread as a general rule show a gradually increasing thickness from each end of the cocoon towards the middle, where it is thickest, in some instances by as much as a third. I consider the exceptions to be accidental, and in no way invalidating the theory and discovered fact. In the diameter of the bave it is noticeable that towards each end of it the disproportion in diameter of the two fibres composing it becomes gradually greater, so that often at the beginning or end of the cocoon one fibre or brin is much thicker than the others. Now, it will be asked, what is the practical outcome of all this? First, a silken thread or fabric is best when equally strong, and also when equally thick or equally thin. As it is always the practice in reeling cocoons to reel, say, four or more cocoon threads together, it is manifestly impossible to reel an even flature or thread of raw silk if the cocoons are all commenced at the same time, or if cocoons are taken varying much in the size of their threads. This investigation tends to instruct those engaged in reeling the cocoons by clearly showing where the inequalities are, and at the same time to guide them in greater niceties of manipulation so as to secure as even and perfect a result as possible. Where the bave differs so much in thickness as one-third, it is impossible to expect an even thread to be constructed by rule of thumb, and I am glad to say that the Chamber of Commerce at Lyons places very high value on these examinations. Greater attention is paid to this already in Italy, France, and Broussa, than perhaps, elsewhere; although much of the Japanese silk is excellently reeled. I have a sample of Bengal silk, which has been lent to me by a Leek manufacturer of sewing silks, which he states is so beautifully reeled as to produce silk thread for the sewing-machine, of perfect regularity and strength; but for some time great complaints have been rife as to the unequal reeling, and consequently unequal sizing of China silks. It is impossible to construct delicate fabrics in the loom, where evenness is required, unless the silk is well sized. The same





### Card Grinding.

The matter of grinding cards or shears is very important; as easily overdone as neglected, and although easy enough to describe, by no means a process to be learned entirely from books. "In setting the emery rollers to grind the cards, do not set them to bear too hard or too heavy on the wire, for this will heat, soften or break the wire, if it is not very good and tough. The emery rollers should be seven or eight inches in diameter, and always two or three inches wider than the card cylinders, so that they may traverse an inch each way on the cylinder, and not leave any of the wire bare. Traversing is effected by means of a waving pulley, about  $5\frac{1}{2}$  inches in diameter; the outer rim or edge of the pulley runs in a slot attached to the stand of the roller; or the traversing is produced by a crooked strap, which, fitting between the rims of the pulley, will move the emery roller longitudinally and around at the same time. The traverse motion may be also produced by a waving pulley at the emery roller. The emery roller must be kept on the cylinders until they are ground perfectly true, and until the greater portion of the teeth are ground to a point. The perfect rotundity of the cylinder may be ascertained by the sound it produces on the emery roller as it runs; the sight may also be of service in this respect, either when the cylinder is in motion or by stopping it and giving it a careful examination. When the surface of a card cylinder has been sufficiently ground it will have a blackish appearance, while those parts that are not ground enough will appear more or less clear and bright. As long as a considerable quantity of white teeth appear the grinding must be continued. One day will be sufficient to grind up a new card, if the emery is in tolerably good order."—*Baird*.

"All the rollers covered with card clothing are ground, with the exception of the fancy alone. The object of this operation is to equalize the teeth, to render the surface of the cards perfectly cylindrical, and to give the necessary sharpness to the teeth. The sharpness of card clothing is more apparent in the finer qualities than in the coarser. Grinding is certainly more readily performed when the roller is perfectly cylindrical, the teeth and leathers of the clothing both uniform throughout, and the emery covered cylinder well rounded. In order to grind either a main cylinder or a doffer, two movable pedestals are placed on the parallel sides of the frame for supporting the grinding roller, on the axle of which is fixed a pulley one-fourth or one-fifth the diameter of the roller itself, so that the grinding roller has four or five times as great a circumference velocity as the pulley. To set the grinding roller in motion, a pulley is thrown into gear on the side opposite that of the one intended to drive the roller to be ground. This pulley is driven by that of the drum. If, for instance, a doffer is to be ground, it must be made to revolve slowly, whereas the grinding roller turns very rapidly. This latter roller is then brought towards the doffer very gradually, as there is a greater loss than gain in too much haste. If we approximate the rollers too closely, the teeth to be sharpened will only break off, so that we had better never hurry the work. The two rollers work in the same direction. Among the instruments invented to improve the operations of grinding and straightening the teeth, we must mention that of Mr. Moriceau, of Mout. It consists of a grindstone, either of sandstone or emery, driven with a traverse motion. The cards treated by this apparatus are in no way injured, but, on the contrary, their teeth are better sharpened. For grinding the cards of workers and strippers we generally use a turned cast iron cylinder, covered with one or more coats of emery, and mounted on a cast iron frame, on which may also be fixed three or four of the small rollers to be ground. These workers and strippers are arranged around the grinding cylinder and the apparatus set in motion, so that several small rollers can be ground at once. After being ground in this way, the rollers are subjected to the action of a cloth covered with fine emery powder (canvas emery). We can easily make canvas emeries for ourselves by adopting the following plan:—Dissolve (by the heat of a water bath) in one litre of water—isinglass, 200 grammes: good glue, 100 grammes.

Spread the canvas to be covered on a table, and by means of a brush paint it over with this glue; then sift fine emery powder over the glue thus spread out, equalize the surface with a smooth roller, and after drying, the material will be ready for use. This cloth is usually mounted on two quarter circles, bound together by two parallel cross pieces. The process of grinding is terminated by exposing the card clothing of the roller, while revolving, to the action of the canvas emery thus mounted, and then giving a last finish by the application of a leather, mounted in the same manner as the canvas emery and smeared with oil and grindstone dust."—*Leroux*.

Shear grinding is quite another matter: this is done with very fine emery for a time, but after a while the revolver, ledger-blade and rests, should be sent to the makers to be trued, or else, what is better, a machine for the purpose should be at hand and used once or twice every year. In preparation for grinding, back off the ledger so far that a light wrapping paper may be drawn between the blade and revolver. Next ascertain the relative position of the revolver and blade: this is most accurately done by use of a try square and straight-edge. Place the angle of the square upon the centre mark made in the boxes of the revolver by the makers. Lay the straight-edge on the ledger-blade letting the end project to meet the square. The revolver will doubtless be found too high, if so, drop it to its proper place, when there, about  $\frac{1}{16}$  inch of the square should be visible under the straight-edge. Some advise setting up the blade instead, but this will not be of much use if the blade is properly set. (It should not be under the revolver too much.) By dropping the revolver further, a deeper concave may be made. This is not desirable, because it will not retain sharp edges so long. Let up the blade to within the thickness of tissue paper. Next, cover the brushes and rest, to protect them from oil and emery. Put the belt on to reverse the revolver. Having mixed flour of emery and oil to the consistency of cream, apply it with a large paint brush. The advantages of a brush over those of a strap are obvious to any thinking mind. While applying the emery set the blade closer from time to time but only a very little at a time. When the grinding is completed, polish the ground surface by thinning the emery with oil, then follow with clear oil, or a little oil and plumbago. The revolver should next be taken out, everything well cleaned and the ledger blade honed to turn the edge towards the bevel. Never hone enough to make a bevel on the face. Now, let the blade down to the rest to make sure that they correspond in setting; replace the revolver and give it a few turns to cut off the rough edge which was turned over by honing. If the grinding have been successfully accomplished it should now cut tissue paper smooth in all parts without further setting. If this test prove all correct, it is not well to alter the relative position of the blade and revolver until it is necessary to grind again. To bring the edges closer together raise the revolver a trifle.—*Spitali's Manual*.

### Cheap Telegrams.

Respecting Postal Telegraphs, a correspondent writes thus to a contemporary:—"We have always felt a pride in the Post, though it is anything but gratifying to find ourselves distanced in the race, as I find we are upon passing our Channel frontier into France and Belgium. It was but a few days ago that I aided an American gentleman to send a telegram from the coast to Paris at a cost of fivepence only, and again in Paris, where we sent another telegram containing a diagram and an indication of colour and one hundred and forty-seven words, for fivepence; in all, two telegrams at a total cost of tenpence. In England these would have cost eight shillings, or exactly ten times the sum charged, and, moreover, it would have been impossible in London to have sent the diagram or the colour. The Paris service being pneumatic, there is no limit to the number of words you may place upon a card, price three-pence, or upon the closed envelopes, sold for fivepence, affording secrecy and double the surface. I have myself sent right across Paris a *Carte Télégramme*, with a coloured sketch thereon, that in half-an-hour has placed the article desired at my door and an order in the hands of a fabricant of a remote district. Truly they manage some things better in France than we do over here, and their *Service Télégraphique* is one of them, and so thought the American, who 'made a note of it.'"





### Mill Architecture.



LECTURE was recently delivered by Mr. C. J. Hexamer, before the Franklin Institute, Philadelphia, on Mill Architecture, with special reference to the prevention of fires. The lecture will be found most interesting, and we have pleasure in giving it in these columns in the hope that it may be of practical benefit to our readers.

**FLOORS.**—The safest floor, which has for a long time been used in fire proof construction, is one consisting of brick arches, sprung between iron girders. In order to be of practical value, the spans must not be too large, as iron, which is an excellent conductor, soon warps by unequal expansion in case of fire, and is apt to throw out the intervening arches. When spans are large, the intervening arches readily drop out of the girders which hold them, and thus entire buildings, which were considered fire-proof have been totally destroyed. Care must, therefore, be taken to cover all exposed iron surfaces with a poor conductor of heat. A construction much used in France, which has proved successful in many cases, is an iron girder with concrete arches, the arches being formed by means of moulds and held together with tie rods until dry. When good concrete dries, it becomes as hard as stone, and being an excellent non-conductor of heat, when properly erected, so as to surround the entire iron work, keeps the iron from becoming heated and warping. Iron girders have also been used in conjunction with terra cotta, and with the so-called terra cotta lumber. Terra cotta lumber is a material manufactured from clay and saw-dust. The clay mixed with saw-dust, is formed into the required shape, then dried and burned in a kiln; the organic part is destroyed, and a porous mass remains which may be worked with a chisel like lumber. Tests which have been made with this material in New York have proved very satisfactory. A concrete floor, when made with good cement, is, next to a brick arched floor, the best known. This substance forms into one solid, hard, rock-like mass, and those who have seen the works in France, where entire churches and aqueducts have been built with it, can no longer doubt its efficiency. It may be well remembered how at the great fire of the Jayne buildings, in Philadelphia, an ordinary mortar floor saved the second story. The problem then is, "How can we construct a cheap, light, and effectual floor?" A solid three-inch plank floor, laid flat, tongued and grooved, with one and a quarter inch flooring boards on top arranged for flooding, is the usual manner in which the floors of mills are now laid. These can be much improved if, between the planks and flooring boards, a layer of good mortar or concrete is inserted, making an excellent, slow burning floor. Asbestos paper, or better, the thicker asbestos mill board, is sometimes used, with good effect, between the flooring boards and plank; although it has been claimed by some that the asbestos is hygroscopic and attracts the moisture from the flooring, causing the boards to rot. All floors should be arranged for flooding. This is accomplished by raising all sills and other openings through which water may escape. A floor arranged for flooding, when otherwise well laid, is one of the best means for restricting a fire from extending from one room to another, for, as soon as the fire appliances, such as sprinklers, hose, etc., are turned on, there is, in a very short time, a pond of an inch or an inch and a half deep formed on the floor, which prevents the floor from igniting; at the same time, a rise in temperature vaporizes the water on the floor, causing the formation of steam, which aids in extinguishing the fire. We are now fairly well protected from fire, smoke and water from above, how then are we to protect the wooden ceiling in case of a fire from below? The simplest (but costly) method would be to iron-line all wood-work; another would be to cover the wood-work by a so-called fire-proof solution. It is well known, that several preparations exist which render wood impervious to heat, and, at the same time, increase its durability. Some of the solutions have been tried on a large scale, and have proved themselves successful wherever used. Although these measures are cheap, and their success demonstrated, they have, with few exceptions, (as for example, at Frankfort-on-the-Main, the Hof Theatre, at Berlin, and several German manufactories), not been employed. Perhaps the general public will, in view of frequently recurring catastrophes, at last comprehend that even the retardation of the combustion of wood-work would be of inestimable value in securing immunity from fire, and that the spreading of flames will be greatly retarded if, instead of burning rapidly, as dry wood will, it slowly chars into coal. The nature of wood makes it an easy matter to change it into a state frequently, though incorrectly, called fire-proofed. On account of its porosity, a solution applied to its surface sinks deeply into its pores, thereby attaining a firm hold, and on account of its rigidity exposes only the covering to abrasion. Care should be taken where such solutions have been used, to replenish them, from time to time, so as to keep the wood entirely covered. Asbestos paint is a clean and excellent coating for wood, and still better, the thicker asbestos concrete. These substances act like true paints, adhere tightly to the wood, give protection against high temperatures, and do not readily rub or chip off. It has but one objection; that is, its solubility in water; it cannot be used in places exposed to the action of water, but for most interior purposes this is no material objection. Great care must be taken in purchasing this article, and it should always be tested before being used, as much of the so-called "asbestos paint" which is sold is entirely worthless. Ordinary whitewash is a cheap and excellent coating against fire. It adheres tightly to the wood, impregnating it to a certain depth, and, when frequently replenished will form an excellent protective coating. Wood, impregnated with ammonium sulphate, transforms it into a condition which has frequently, but incorrectly been termed "fire-proof." Ammonium sulphate keeps the wood from burning with a flame,

and only those parts which come in direct contact with fire are charred, but the parts in contact with flame, even in charring, will not transmit the fire any further. Numerous experiments which I have made with ammonium sulphate, have, in every instance, proved successful. At the severe fire of a large chemical works, where parts of the wood impregnated with this substance, in direct contact with the flames, were charred, the adjacent parts remained intact. When ceilings are plastered, this should be done with wire netting and the plaster laid on it, especial care being taken that the wire netting follows the outlines of the ceiling closely, so that no hollow spaces occur. The correct method is to avoid all hollow spaces, in which dirt may accumulate and fire travel. The so-called "sealed" ceilings, that were formerly in vogue, should always be avoided.

**GIRDERS.**—Girders should be solid. When it is necessary to use compound girders, they should be tightly bolted together, so as to leave no intervening spaces. In storehouses, etc., where there is but little vibration, girders may be inserted in the wall by placing them either on brackets or a short distance into the wall, with bevelled edges, without any further anchoring. In mills, where the amount of vibration is great, Woodbury advises to securely bind the beam to the wall by embedding in the masonry a flat cast-iron plate with a transverse fin upon each side near the end, one to secure the plate in the wall and the other in a groove across the under side of the beam, firmly secured by wedges driven in at each side of the fin. The bricks in the wall for about five courses above the beam should be laid dry, and the upper edge of the beam at the end slightly rounded, and an air space should be provided at each side of the beams. Under no consideration should the old-fashioned anchorage of fastening the girder on the outside of the wall with a large anchor plate be used, as when the beams burn through, the leverage brought to bear on the wall will overturn it.

**WALLS.**—Brick is the best material for fire construction. It stands long after granite has disintegrated, and marble has been burnt into lime. Iron fronts are to be deprecated, and especially such shells of iron as are frequently erected, without even a brick filling. Sandstones, when the sand particles are held together by a good binding material are serviceable, but those in which the sand particles are held together by lime should not be used in building. Granite is a very poor stone for fire construction, as its inter-molecular spaces contain water, which, on being heated vaporizes into steam, causing the disintegration of the stone. Marble is also a poor material to use, as, on becoming heated, it is decomposed, carbonic acid and burnt lime being formed. For this reason, lintels over doors, windows, etc., should never be made of marble, granite, or poor sandstones. Preferably, a brick arch should be used. Good brick buildings have frequently been destroyed by having poor stone lintels over driveways and so on, which were destroyed by fire, causing the falling of the brick wall. When further ornamentation is required, terra cotta ornaments may be used; these are now manufactured in all shapes and varieties.

**CORNICES.**—Where cornices are used, these should be of brick or terra cotta. Under no circumstances should "wood-boxed" cornices be used, as these transmit the fire from one part of the building to the other, and for this reason, even hollow metal cornices are objectionable, as they form flues along which the flames travel.—**COLUMNS.**—The best column to stand in case of fire, is a good hard wood column, without taper, bored near the top and bottom so as to prevent dry rot, lined with sheet iron or any other metal, or covered with a good protecting substance. Of all columns, those of exposed cast iron are the poorest. These, on even a slight rise of temperature, readily disintegrate, especially when water is poured upon them. Wrought iron, on being exposed to high temperatures, expands and warps. Exposed iron, therefore, is the most untrustworthy of all materials for column construction. In order to protect iron columns from surrounding temperatures, numerous plans have been devised to cover them with non-conductors. The columns constructed by Mr. Wight, of Chicago, are excellent for this purpose. Terra-cotta lumber has been used for this purpose, as well as plaster and mortar. Ordinary lime mortar or concrete is preferable to a gypsum composition, as this readily corrodes the iron. Care must be taken to surround all parts of columns exposed to abrasion, the base should have a hood of wood.—**ROOFS.**—There is no part of a building put to such a severe wear and strain as the roof; being, at certain times of the year, exposed to high temperatures on the inside, and to very low temperatures on the outside. A good roof should be of three inch plank, tightly fastened together, protected on the outside with sheet iron or other metal, asbestos concrete, or with a wire netting tightly fastened on, so as to leave no hollow spaces, and the plastering placed on this, a good metal covering being placed on the outside with nails counter-sunk and stopped with putty. Slate makes a poor covering, as by a rise in temperature it readily disintegrates.

(To be continued).

### Factory Hours in the United States.

The problem of factory hours for young children is coming up for solution in the United States. In the States of New York and New Jersey, according to official reports, children of the average age of nine years are working ten, eleven, and even fourteen hours a day all the year round. The natural effect upon the growth and health of these little ones is not escaped. Irish families are instanced in New York State, of which the girls on arrival, were as "healthy and rosy-cheeked" as could be desired; but after two years the health was undermined by consumption, and in seven years "half the family would be gone." The wages earned by the children weekly "do not average" two dollars, or eight shillings, an amount which does not go at all as far in New York as it does in England; but it is said that the families cannot dispense with these earnings of the little ones, and that even with them "a majority of families barely make both ends meet," and a considerable number find themselves actually in debt at the end of the year.





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## ORIGINAL DESIGNS.

The pattern given on our first plate is intended as a design for a Hearthrug. If produced in a good effect of colouring it will make a very pleasing and saleable rug. The colours employed might be as follows: the ground a deep Indian Red, with the figure in Electric Blue, Sage Green, Pale Grey, Old Gold and Indigo, with touches of Maroon and Pink. This pattern has been designed by Mr. R. Lord, 97, Park Road Bradford.

The second plate consists of a design for a Leno Fabric, which is noticed under the Original Designs on page 19.

The third design has been drawn by Mr. J. G. Bowins, Dow Street, Brunswick Street, Manchester, and is given for a Damask Quilt.

### TO MANUFACTURERS AND DESIGNERS OF CLOTH.

The latest patterns of French and English Coatings, Vestings, Suitings, Fancy Cloths, Cassimeres, Tweeds, Mantle Cloths, &c. These Patterns give the latest Designs and Colourings for Cloths for the Spring and Summer Seasons in 1886.

### 100 SAMPLES FOR £2. CARRIAGE PAID.

A remittance must accompany order, made payable to H. and R. T. Lord, the "Journal of Fabrics and Textile Industries." Office, 10, Ann Place, Bradford, England.



## MONTHLY TRADE REPORTS.

**Wool.**—The demand for English wools during the month has only been of a hand to mouth character, and for Colonial wools rather slow. Stocks in staplers' hands are fairly large, and this fact has a tendency to prevent speculation on their part. Prices, on the whole, keep moderately firm. Spinners of yarns for the home market have their machinery occupied, but, notwithstanding this, they have had a difficulty in maintaining former rates. In the demand for yarns for abroad, there has been a falling off, and prices have consequently been affected. In the piece branch an improvement has been reported both for home and abroad.

**Cotton.**—The markets for the raw material have fluctuated somewhat both in demand and prices during the month. The number of mills on short time increases, and this, coupled with the fact that manufacturers and spinners, who are holders of cotton, are working up the stock as closely as possible, has slackened the demand. The yarn trade has shown a tendency to a rise in prices for most descriptions, owing to the closing of mills and the general running of short time in the cotton districts. Transactions are not of large volume as the enhanced rates keep manufacturers from purchasing more than for their actual requirements. The manufactured article does not keep pace in price with yarns, as the demand continues restricted for most descriptions. It is in contemplation to stop more looms unless business speedily improves.

**Woollen.**—This branch keeps fairly well employed in most departments; worsteds of fine material and good design and colouring taking the lead. The preference seems to be for suitings and trouserings, in small neat patterns, in checks and

stripes. The medium qualities also meet with a fair demand. Transactions in the lower fabrics, for the clothing trade, have shown no new features, and, on the whole, business in this branch is not unsatisfactory. In the Scotch districts, trade has been quieter, and prices have been recently unremunerative.

**Linen.**—Complaints of dulness have characterised the markets in nearly all branches, and manufacturers, as a rule, have been curtailing production. Prices have been very unsatisfactory, and they show no signs of a speedy improvement. The jute branch keeps fair, but prices are no more satisfactory than in the linen trade.

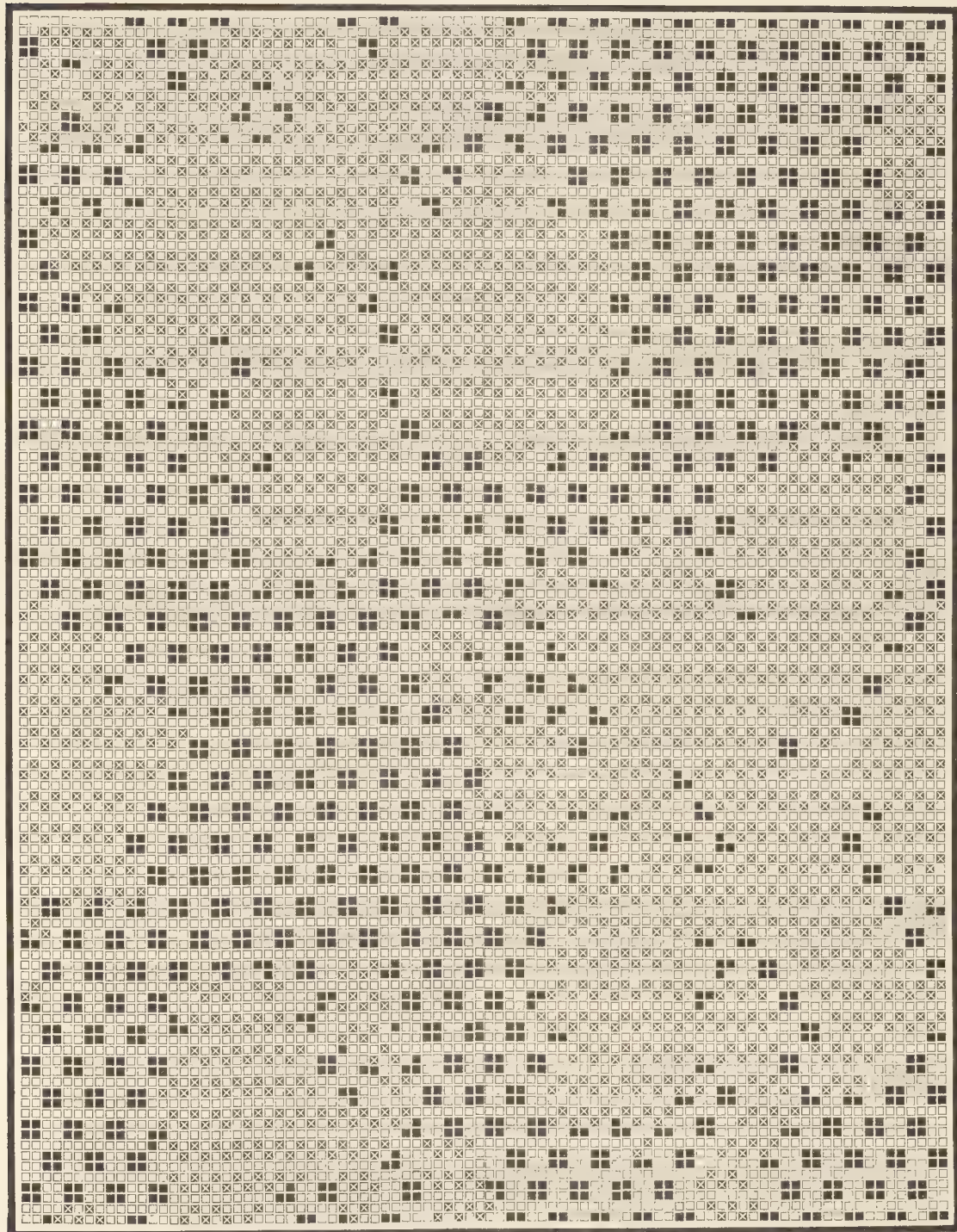
**Lace.**—In the Nottingham district trade has shown no signs of improvement, either as regards demand or prices. Goods in fancy designs and colourings have met with a fair demand, but the fact that manufacturers have had to sell them at exceedingly low rates, makes them loathe to produce more than to actually keep the machinery running. In the Ayrshire district, manufacturers are more than holding their own with Nottingham, whatever the reason may be, and seem to be making goods remuneratively in face of the home and foreign competition, which is severe at present.

**Carpets.**—Trade has not improved in any perceptible degree. The quantity of goods being produced is much below the average, and machinery is but poorly employed. Although, recently, some admirable rugs and carpets, in point of design, colouring and general effect, have been produced, they do not seem to secure any large demand, and prospects for the future do not look particularly bright. Two or three firms in Kidderminster, who have specialties, are selling fairly well, but not in such quantities as to be satisfactory on the whole.

### American Carpet Trade.

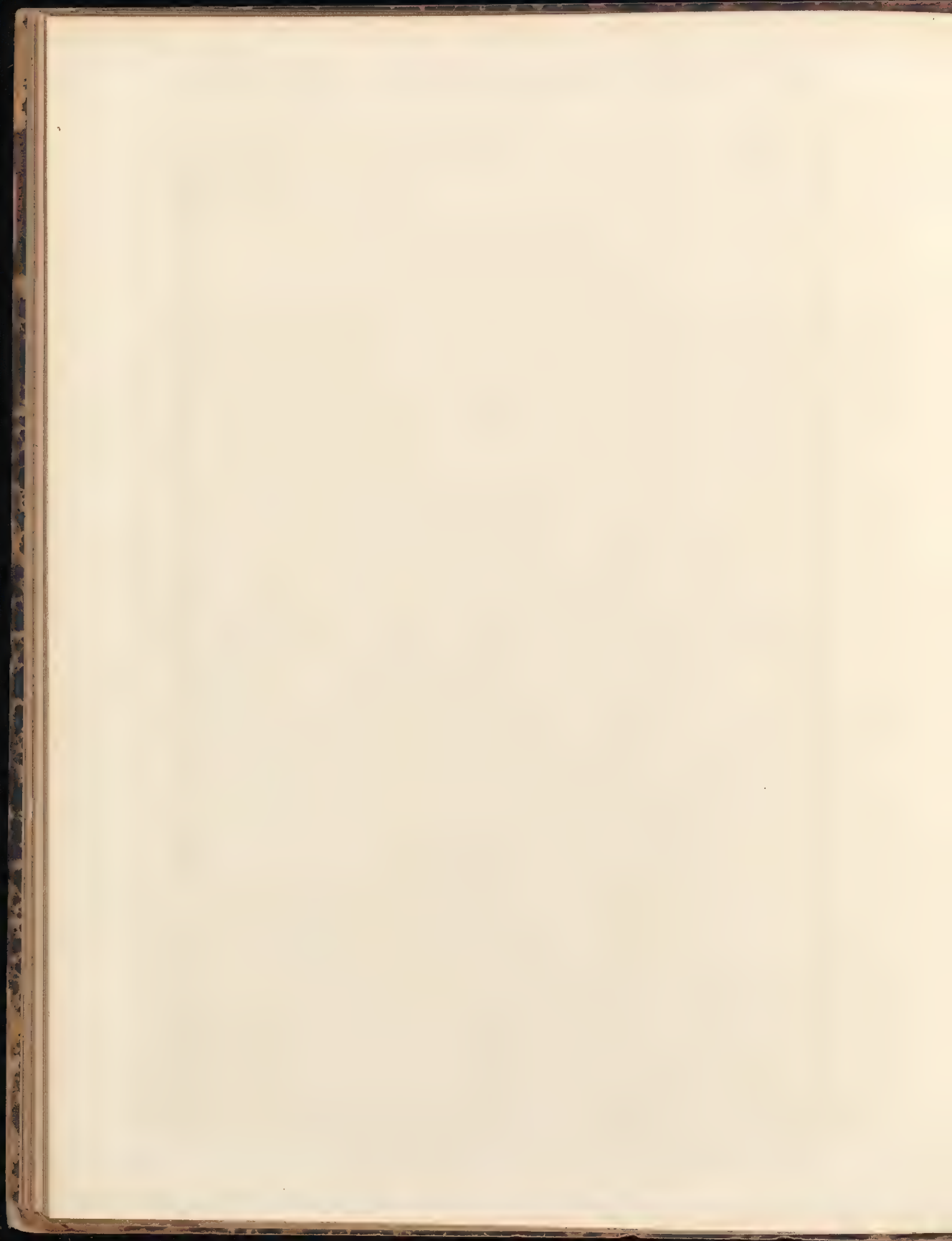
"Taking up arms against a sea of troubles" is a line that might be quoted without implying much exaggeration in characterising the position most carpet manufacturers have been obliged to assume in preparing for the fall trade. Yet, in spite of strikes and other discouraging circumstances, the display of autumn styles is, generally speaking, quite equal to that of any season in the past, and in some respects it exhibits a decided improvement. In Brussels the new patterns show a tendency towards smaller figures and fine effects. In the higher grades Oriental and geometrical designs are the rule. In the lower qualities floral effects are still employed very liberally. There is no noteworthy change in grounds, the proportion of light and dark being about the same. Most manufacturers are rather tired of *ceru* grounds, and would be glad to abandon them, but the public will not permit them to do so, and consequently the colour still remains in many of the latest designs. In the new Brussels colourings, fawn, drab, dull blue, and red are prominent. A greenish drab is also rather conspicuous. Moresque effects are employed about as much as they were last season, but with more discrimination. *Tinsel* is not used at all. The attempt to introduce it into carpets may be set down as an utter failure. In velvets and tapestries considerable improvement, both in design and colouring, is noticeable, especially in velvets, in which some exceptionally fine *moquette* effects have been introduced. The new extra supers deserve special commendation. In these goods our American manufacturers are proving themselves a decidedly progressive class. In both designs and colourings there is exhibited a steady and notable improvement from season to season. The fall offerings in extras have never been equalled hitherto. They comprise a remarkable variety of novel designs and shadings. Some of the combinations are exceedingly striking, and the Moresque effects have been utilized, in many instances, very happily, while at the same time there is an obvious recognition of the fact that some patterns are not adapted for Moresque effects. In Smyrnas the increased number of manufacturers and consequent sharpness of competition has stimulated extra efforts in the design department, and the result is a notable array of really fine goods. The autumn offerings of floor oil-cloths and linoleums also indicate continued progress in the matters of design and colouring. Many choice carpet effects have been skilfully produced by various manufacturers.—*New York Carpet Trade and Review.*





DESIGN FOR LENO.





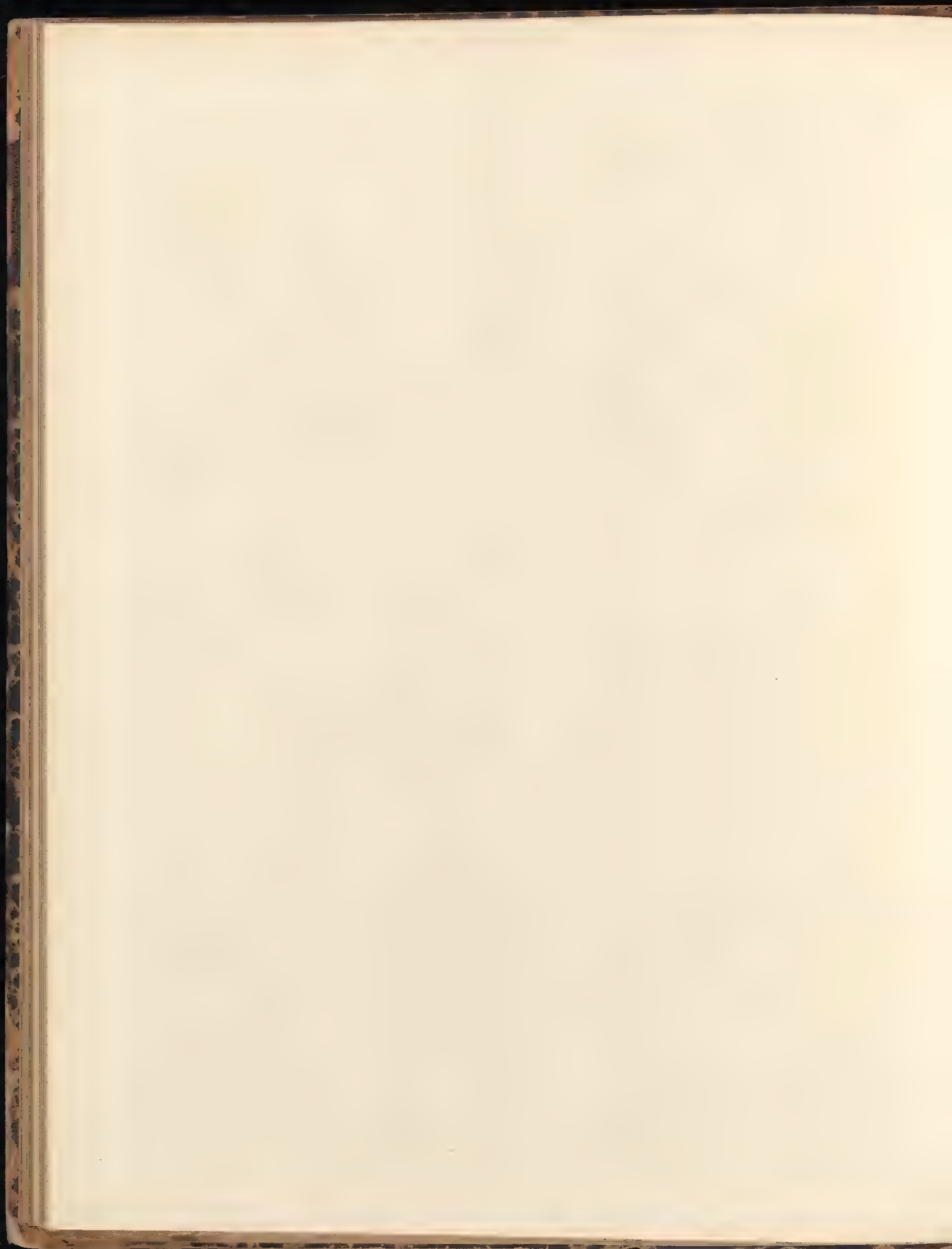


12TH AUGUST, 1885.

DESIGNED BY J. G. BOWEN



DAMASK QUILT.



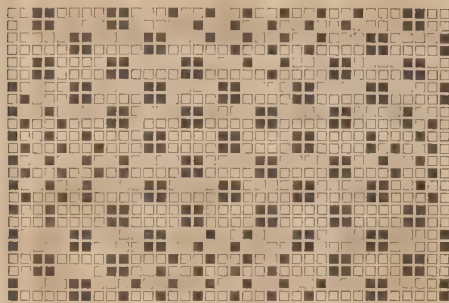




### Designs for Leno, or Gauze Fabrics.

We give two designs for Leno, or Gauze Fabrics, one of which (No. 290) will be found below, and the other (No. 291) on our second separate plate. They may be briefly described as follows: Canvas Leno ground, and plain and weft figure; suitable for a 20's sett, 5 picks. In No. 291 cut ■ and □. We regret we are not able to show the pattern of the larger design more clearly, as our type is not of the most suitable kind for this purpose. This pattern, which consists of a rustic leaf formation, should have been shown as upon 8 × 12 design paper in order to assume proper proportions. In connection with this we may state that Messrs. M. Priestley and Co., Copley Street, Little Horton, Bradford, have patented a harness for weaving this class of goods. It can be seen working at the address named. If rumour speak correctly, Bradford manufacturers will be busy on Leno Fabrics shortly, and many have already got their patterns out. Great hopes are entertained that the attention thus given to Lenos may be productive of a good trade, which will be welcome in these dull times.

No. 290.



Design.

### Cheviot.

No. 292.

#### Warp:

- 2 Olive Brown twist Cheviot, 187½ oz. per yd. } 14  
when twisted.  
1 Olive Brown mohair loop, 120 " " }  
1 Bright " " " 120 " " }  
6 shafts twill.

#### Weft:

- 17 Black twist Cheviot, 187½ yds. per oz. when twisted.  
1 Bright Brown loop, 120 yds. per oz.

#### Draft.



34 picks per inch.  
1,980 ends " "  
64 inches wide in the loom.  
56 " when finished.  
Bright, clear finish.

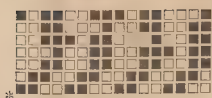
### Saxonies.

No. 293.

#### Warp:

- 6 White, 2 Green Sage twist=23.  
1 Black, Scarlet and Green mohair loop.  
375 yards per oz. when twisted.  
Mohair loop 200 yards per oz.

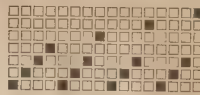
#### Design.



#### Weft:

- Black, Old Gold, Black, Scarlet and Blue loop.  
Same length per oz. as the warp.

#### Draft:



45 picks per inch.  
3,036 ends " "  
66 inches wide in the loom.  
56 " when finished.  
Clear finish.

No. 294.

#### Warp:

- 1 White and Gold, 1 Gold and Peacock Green.  
1 Scarlet and Sky Blue, 3 Dark Brown single.  
Twist when doubled 375 yards per oz.  
Brown 375 yards per oz.

#### Design.



#### Draft.

#### Weft:

- 5 Black 375 yards per oz.  
1 Black and Orange silk, about 37½ yards per oz.

50 picks per inch.  
3,350 ends " "  
3 " in a reed.  
67 inches wide in the loom.  
56 " when finished.  
Bright finish.

No. 295.

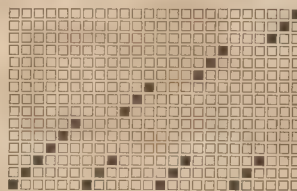
#### Warp:

- 2 Black and White, 1 Black and Blue.  
2 " " 1 " Scarlet.  
2 " " 1 " Yellow.  
625 yards per oz. twisted.

#### Weft:

- 2 Black, 187½ yards per oz.  
1 White and Scarlet, 1 White and Green.  
225 yards per oz. twisted to 500 yards per oz.

#### Design.



#### Draft.

2,700 ends per inch.  
32 picks " "  
3 ends in a reed.  
66 inches wide in the loom.  
56 inches wide when finished.  
Smart finish.

### Worsted Suitings.

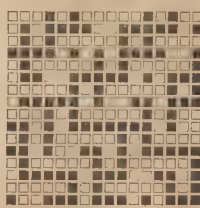
No. 296.

#### Warp:

- 12 ends, 18's Black worsted.  
1 " Dark Crimson, Blue and Green 18's.  
1 " Light Emerald Green 18's.  
1 " Dark Crimson, Blue and Green 18's.  
1 " Light Emerald Green 18's.

16

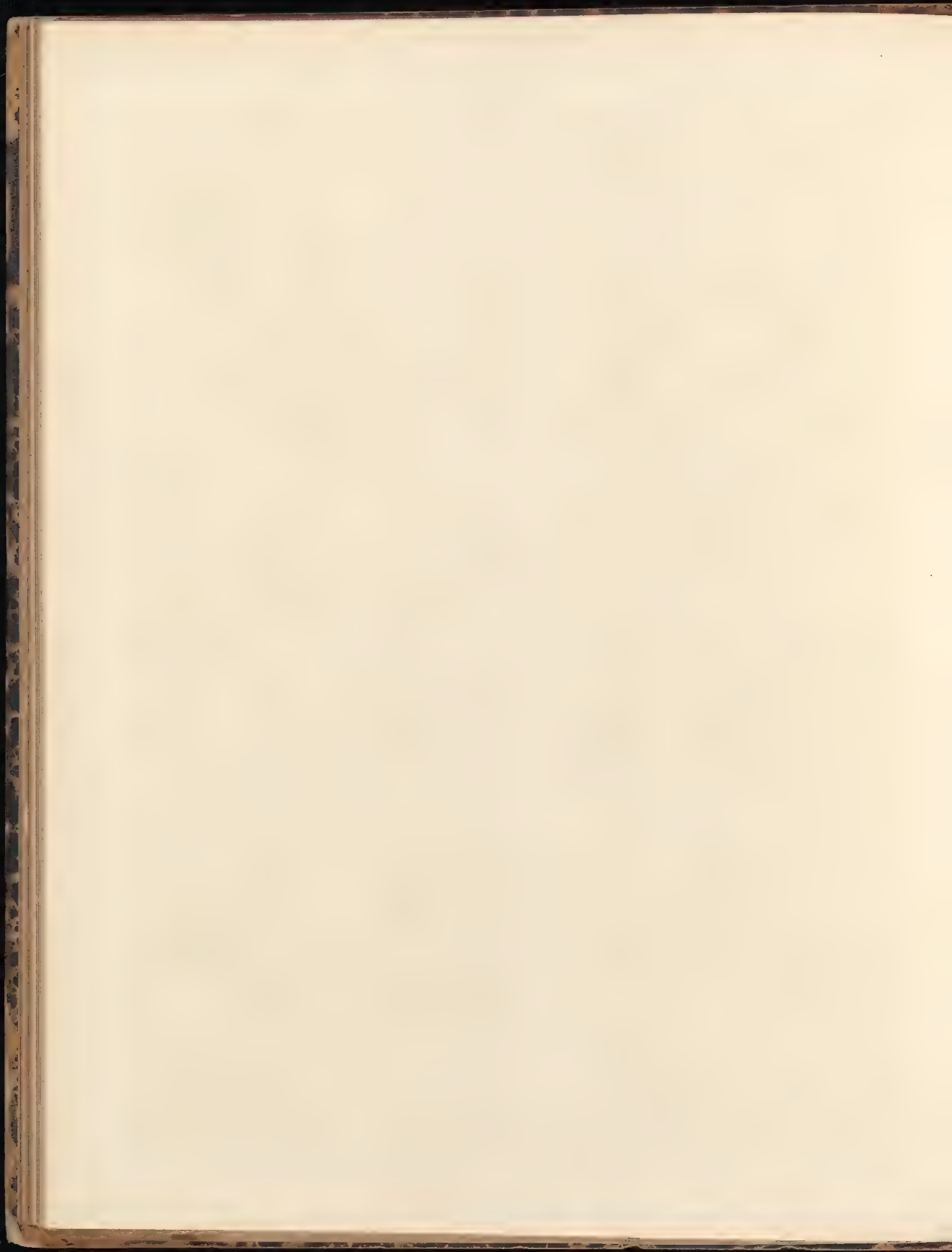
#### Design.



#### Weft:

- 5,016 ends.  
76 ends per inch.  
70 picks " "  
19's reed.  
4 ends in each split.  
66 inches wide in the loom. 16 picks.  
56 " when finished.  
Clear finish.

- 12 { 1 Black worsted.  
1 Black woollen, 22 skeins.  
4 { 1 Dark Crimson, Blue & Green  
1 Black woollen.



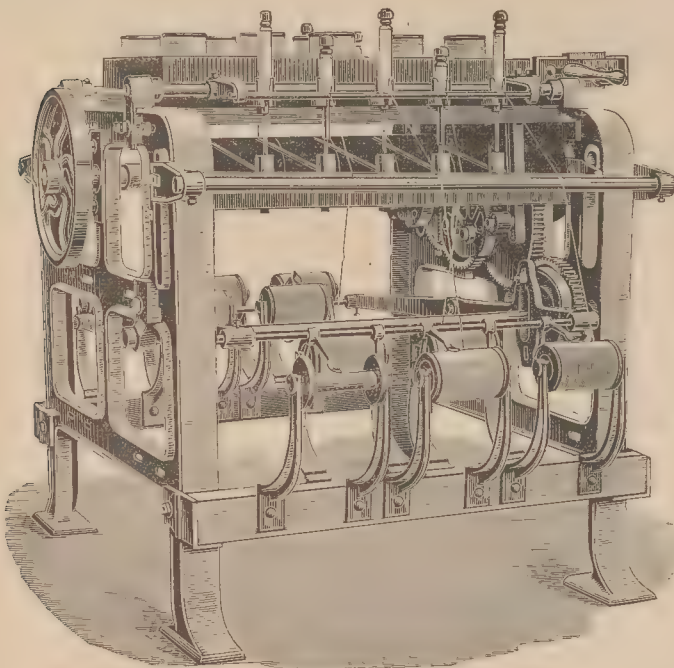




## MACHINERY, TOOLS, &c.

### Pickles's Patent Pirn Winder.

The principle of this invention is to reverse the irregular drag or tension that exists in the old pirn machine, and so to make the pirns or bobbins hard at the nose instead of at the top or the outside of the pirn. The build of a cop or pirn being conical in shape, as the yarn rises on to the large diameter or outside, the thread increases in its speed and also in its drag, and so causes many breakages. The most drag is applied when winding on the small diameter, and when the yarn is being pulled at the slowest speed, by which means it is bound tight to the bobbin, and this prevents its slipping off in rings in the



weaving. The inventor is Mr. J. H. Pickles, manufacturer, Burnley, who in the course of his business has found much difficulty in winding low qualities of yarns. By the method under notice this is rendered quite easy, and amongst the advantages claimed for this invention is that breakages are almost dispensed with. It will run at almost any speed, the cost is small and the pirns produced by it are as hard as wood. It is unnecessary for us to enter fully into the subject, but will refer our readers to the advertisement on page V., where an exhaustive description is given.

### New Looms.

From an American Exchange we hear that a power loom for silks has been patented, which—in the United States—is said to surpass anything in silk looms in Europe or America. It is adapted for light and heavy qualities of grosgrains, satins, brocades, &c., for weaving with or without dobby. The take-up motion can be changed to any number of picks without changing wheels or pinions. No treadles for weaving grosgrains are required, the harness being moved regularly, without jerks, by a heart-shaped contrivance on the driving shaft. The new dobby belonging to the loom requires no springs or weights on the harness, and prevents any mispicks. The loom is said to run 120 to 130 picks per minute on grosgrains, and up to 150 picks

on satins. The Electric Round Loom, patented in Germany, will be noticed with interest by those engaged in the textile trades. The patentee claims—Firstly, a method to weave simultaneously several pieces of cloth on a straight or round loom so as to have the warp threads of all the pieces bound by the same pick, the felling is cut and the end is woven in as an edge. Secondly, a round weaving loom for the operation of this method, with sectional reeds and harness, a revolving pick motion from a central shaft by means of electro-magnets, and without straining the warp threads. An Exchange says the invention permits of one or more picks being woven at the same time according to the width of the pieces required to be woven. Whatever the number may be, a corresponding number of shuttles is employed and operated by electro-magnets. The warp forms a vertical cylinder, around a central shaft. The reed consists of a number of horizontal ring-sections, which work independently and alternately up and down, and down and up, for closing the filling. The harness is arranged similar to the reed, in sections placed fan-like around the vertical central shaft, and consists of twenty eight sections at four shafts each, which also work independently and horizontally. At the places for the edges, the warp is separated two centimetres (about four-fifths of an inch), and a knife cuts the filling; the edge is formed by weaving the end back into the warp with the next pick. A take-up motion for every piece is on the loom; at the breaking of the filling, the loom stops automatically. The loom is set in motion by letting an electric current into the electro-magnets, the shuttles are placed before the arm of the picking motion which holds the electro-magnets and is attached to the central shaft. The latter revolves by means of a screw without end connected with the driving shaft under the ceiling.

Eccentrics move the reed and harness sections, the shuttles pass over the reeds, which rise and fall again before the next shuttle passes, while the harness shafts change. At each revolution of the central shaft four picks are woven, the cloth is cut and the edges are formed; each piece is taken up by a regulator and laid in an open box on the top of the loom. The warp beams are arranged in a circle on the floor. The loom can be arranged to weave from two to six pieces according to the width desired.

### The Silk and Satin Trade in London.

One may now fairly judge of the character of the productions likely to prevail in each department. Broad silks, though not expected to be sold in the form of dresses for ladies, under the old aspect of plain fabrics, or of brocades, or stripes or checks, which once used to prevail, now figure under the changed shape of a variety of fancy fabrics of mixed materials, as spun silk, silk and wool, silk and cotton, &c., some thick goods of great substance that are fit for women's jackets and mantles being likely to be sold to a considerable extent for this purpose in black. These are mostly of Berlin origin. Satins have sold largely of late years, a great many of these being employed as trimmings, and for subsidiary purposes, prices being extremely low, for which we are indebted mainly to the Germans; but it is questionable whether they will be taken as freely as they have been during the present season. The extreme lowness in price of these satins causes them to be very useful in the production of quilted satin petticoats, which, however, do not seem to have been wanted to the extent that formerly prevailed in the winter seasons of some previous years. Prices in this line seem ridiculously low to those who have gone out of the trade for some

little time, and have come back to it again, but silk is now at a very low price, while cotton is so skilfully used that it forms the chief portion of the fabric, the silk in unions being thrown upon the surface as much as possible, its cost being reduced as well by the weighting process that is now commonly resorted to. There is a thick, firm backing to the goods intended for women's jackets, this enables them to stand the strain to which such garments are subjected in the course of ordinary wear, gives them body and firmness. Spun or waste silk, too, is largely entering into consumption in home-made fabrics that aim at being of a "silky" character, which it is satisfactory to notice, this branch appearing to be one that is likely to be very much increased with the accretion of time, particularly in upholstery goods.

By a recent interpretation of the Customs Department at Ottawa, Canada, the phrase "damask of cotton" is held to include damask tabling, napkins, doyles, table cloths and similar articles; and "All fabrics composed wholly or in part of wool," is held to include wool table and piano covers and similar articles not elsewhere specified in the tariff rates. Crash and huckaback towels in the piece are now classed at a 20 per cent. duty, and all other towellings at 25 per cent.

## No. 297.



Design.

Warp: All 27's worsted two-fold.

Weft:

- 1 worsted 27's twist.
- 1 woollen 17 skeins.
- 1 worsted.
- 1 worsted and White silk twist.
- 1 woollen 17 skeins.
- 2 worsted.
- 1 woollen.
- 1 worsted.

9 picks.

- 8,448 ends.
- 128 threads per inch.
- 112 picks "
- 16's reed.
- 8 ends in each split.
- 66 inches wide in the loom.
- 56 " when finished.

## Woollen Suitings.

## No. 298.



Design. \*

Warp:

- 3 ends Blue, 22 skeins twist.
- 4 " Rifle Green, " "
- 4 " Lemon, " "
- 1 " Fawn, " "

12 ends.

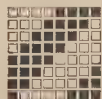
Weft:

- 11 picks Black, 22 skeins.
- 1 " Fawn, 22 "

12 picks.

- 2,448 threads.
- 86 ends per inch.
- 86 picks "
- 18's reed.
- 2 ends in each split.
- 68 inches wide in the loom.
- 56 " " when finished.

## No. 299.



Design.

Warp:

- 4 ends Dark Drab.
- 3 " " Brown.
- 1 " " Blue.

8 ends.

Weft:

- 4 picks Light Lemon.
- 3 " Brown.
- 1 " Black and Orange twist.

8 picks.

- 2176 ends.
- 32 ends per inch.
- 32 picks per inch.
- 16's reed.
- 2 ends in each split.
- 68 inches wide in the loom.
- 56 " " when finished.

All 20 skeins twist.

## Our Yarn Trade with the World.

The annual statement of the trade of the United Kingdom with the rest of the world, compiled by the Custom House authorities, contains some interesting information for cotton spinners. From this it appears that the weight of yarn exported last year (1884) amounts to nearly 271,000,000 lbs. against 215,000,000 lbs in 1880, or an increase of 25 per cent. in five years, or 5 per cent. per year. One would have thought that this increase would have been an indication of good trade; indeed, one section of the community claims it as such, but it is well known to cotton spinners that as the trade has increased the profits have decreased. The import of cotton yarns into this country looks like "carrying coals to Newcastle," yet we imported last year some 8,000,000 lbs. nearly 7,000,000 lbs. of which came from Germany. It is satisfactory to see that the quantity of imported yarn has, since 1880, rather declined than otherwise. The most of these yarns are probably re-imported English spinnings. Judging by the declared value of the total export of cotton yarn, the price per pound has fallen from 13-25d. in 1880 to 12-24d. in 1884; equal to a decline of 7-6 per cent. This decline in value is but small when compared with the decline in value of some of the articles for which our yarns have been in exchange to other countries. For

instance, Indian spices have declined in value, since 1880, 41 per cent; Indian rice, 16 per cent; Indian jute, 18 per cent; Turkish gum, 23 per cent; Turkish drugs, opium, 20 per cent; many other instances might be quoted. In passing, it may be noted that Liverpool exported last year of the produce of the United Kingdom alone 87 millions sterling, out of a total export from all the ports in the kingdom of 233 millions sterling value, or 37 per cent., not including foreign and colonial produce and manufactures. This may be interesting to the promoters of the Ship Canal. Going into particulars, among our foreign customers for English cotton yarns Russia was at one time a considerable customer, but there has been a marked decline during the past few years. In 1880 she took 10½ million pounds, while in 1884 she took short of two millions. The total exports to Russia have during this period declined from 9½ millions to 6½ millions sterling in value. Sweden, Norway and Denmark have somewhat increased their consumption of cotton yarn since 1880, our business with the first and last named countries being considerable. Germany has gradually increased its demand for English cotton yarns from 28½ million pounds in 1880 to 39½ million pounds in 1884. To Holland we sent 30 million pounds cotton yarn in 1880, and 46 millions in 1884, yarns being admitted into that country duty free. Belgium took from us 5½ million pounds in 1880, and 13½ million pounds in 1884—more than 100 per cent of an increase. In 1883 we sent treble the quantity we sent in 1880. France, since 1880, has been doing an ever-increasing business with us in cotton yarns. In that year we exported less than five million pounds, and in 1884 over 14 millions, so that our business in yarns has nearly trebled in five years. Our exports of cotton yarn to Portugal have increased since 1880, but the business is only small. Spain does a varying trade in English yarns. In 1880 she took 118,000 lbs.; 1881, 241,000 lbs.; 1882, 1,324,000 lbs.; 1883, 1,168,000 lbs.; 1884, only 183,000 lbs. Italy took, in 1880, 10½ million pounds, in 1881 she took double this quantity. In 1884 the business fell off to 14½ millions. Our yarn business with the Austrian territories has increased since 1880 from about two million weight to three-and-a-half million in 1884. We seem to be doing a nicely growing business with Greece in yarn, the quantity increasing from 900,000 lbs. in 1880 to 1,600,000 lbs. in 1884. With Bulgaria and Roumania our yarn trade is variable, but between the two periods there has been a marked increase. Our trade in cotton yarns with Turkey has doubled since 1880. Egypt has only taken a slight increase since 1880, but considering the disturbed state of that country any increase may be deemed satisfactory. Cotton yarns are not taken in great quantities on the northern and western coasts of Africa, but it is pleasing to note that on the eastern coast of Abyssinia a small demand sprang up in 1883, which considerably grew in 1884. Persia takes but little yarn from us, but seems to be more in want of it since 1880. Siam does not yet seem to have learnt how to use our yarns, there being no entry among the exports to that country. Our yarn trade with China is falling off—1880, 19½ millions; 1884, 15½ millions; Hongkong, not included above, 1880, 16½ millions; 1884, 12½ millions. Japan is a good customer of ours, though the yarn trade has declined here as well as in China—1880, 27 millions; 1884, 23 millions. United States of America seems a most unfraternal commercial country. In 1884, while we paid America 31,000,000 sterling for raw cotton, they only took from us £41,000 worth of cotton yarns; despite the fact that we can spin them from their own cotton at something like 50 per cent. less in cost of production. This is a fact which may be very properly pondered over by our new American Consul in Manchester. Mexico and Central America do but a small business in English cotton yarns. This remark applies to the other States of South America. British India is our great mainstay, and is doing a steady and increasing trade with us in cotton yarns, last year taking nearly 95,000,000 lbs. This includes the Straits settlements, and other parts of India. Our Australian Settlements do not appear to be using much cotton yarn, as the item does not seem to have a separate entry in the exports. This remark applies also to Canada and the British West India islands, British Guiana, British Honduras, and the Falkland Isles. It must be understood that these statements refer to yarn in an unmanufactured state. Raw yarn exported last year was equal to about one-fifth of the whole production of Great Britain, which amounted to about 1,411 million pounds weight.

## Tariff Duties on Patterns in the United States.

The Kidderminster Chamber of Commerce has recently represented to the Board of Trade the hardship connected with the imposition of import duties on patterns of carpets carried by travellers who go out on business journeys to the United States. Although the carpets are only taken as samples, full duties are imposed on them at the United States ports, and if a traveller cross into Canada and return to the States, a second duty is levied on the supposition that they might have been landed at a Canadian port. The Chamber asks the Board of Trade to take steps to induce the United States to admit carpet patterns duty free, or to adopt a similar plan to that followed in Germany, where, although the duty is charged on patterns, it is returned when travellers take them out of the country again.



teeth are placed at a certain angle, and the two rollers interlock each other in a way. In the front of the roller is a kind of feeding board upon which the silk is evenly laid. The machine being in motion, the rollers grab the silk and pass it on to the combs upon the cylinder. The latter moves at a higher speed than the two rollers, so that the combs, in dragging the silk through these rollers, give it a certain amount of combing, because the teeth in the two rollers interlock each other, and thus hold the silk very firmly whilst the combs drag the fibre through. After a certain quantity of material is upon the combs, the machine is stopped, and the silk is taken off in the following way. The minder, of the machine cuts between each comb with a large pair of scissors, one comb at a time; he then takes a board, made for the purpose, and gets the silk, and lifts it upon it from the comb, and so on until he has stripped all the combs. Another lot of silk is then put up, and the operation is repeated until a given number of these boards is filled. The combed silk is then put through a dressing frame, and afterwards through a machine called a spreader—that is, the silk is spread out evenly upon the feeding board; it then passes between a pair of fluted rollers, is carried forward by a quantity of combs, and taken hold of by another pair of rollers, and passed on to the drum, which is from 24 to 30 inches in diameter. The combs contain from eight to nine thousand teeth. The rollers in front of the combs move more quickly than the combs, and much more quickly than the rollers at the back. The uninitiated would suppose that any fibre passing through such a body of teeth as the combs contain must be straight enough, but such is not the case. After leaving this machine it is taken off the drum and passed through a similar one, with this difference, that instead of the silk being passed to a drum it is run into cans, and the sliver is very much narrower. After leaving this second machine, it is passed through two or three more, all working on the same principle. All these four machines are fed, not as the first one, but by having the silk put up behind; twelve, sixteen, or twenty, of these ends being put through the roller on to the combs at once. After it has passed through the last of these machines, all of which together contain about 260 combs, and fifty thousand teeth, it is put through a machine called a Gill Rover. The silk is put up from behind in certain numbers of ends from the cans into which the silk has run from the last machine. After having passed through this machine, it is next passed through a machine called "Dandy Rover," which has the same effect upon it as the previous machine; then it is passed to the spinning frame, the action of which is to draw and twist the silk; next it is taken to the doubling frame, where two threads are rolled into one. Then the threads require to be cleared of the little rough pieces found upon them; to effect this the fibres are passed through the gassing frame, where jets of gas burn away all the loose fluffy parts of the material.

### Indian Carpets.

For some years a demand has obtained in England for articles of Indian art industry. This demand has only been aggravated, not satisfied, by the products of gaols in Upper India. Those best acquainted with the carpet work of the Punjab and Cashmere have felt their indignation stirred at the substitution of gaudy patterns and flouting aniline dyes for the peculiar subdued tints and harmonious tracery of the Indian carpet weaver. In Europe, in England, and in America, the Indian fabrics of high class are always in strong demand; and so persistent has been the call for the suppression of the vulgarisms and outrages on taste perpetrated by the gaols, that a company has been formed to concentrate the weaving industry, to direct its efforts for revival, to find a ready market for its work, and to restore what promised in another generation, to become a lost art. The credit of this idea belongs to Mr. W. McGuffin, who has had thirty-two years' experience of the Punjab, and who is better acquainted with Indian carpet weaving than any man now in India. The company has a capital of £100,000, of which some £40,000 were taken up as soon as the scheme assumed form, and it proposes to establish at Umritsur, Lahore, and Pathankote, factories where carpets will be made on the ancient patterns and with all the ancient skill. The company has already secured the services of many hundred weavers, and will, we believe, find that the Punjab Government will abandon carpet making as soon as it can come into the market. This is a great point in its favour. Another point is that its factories will be entirely in British territory; and a third is that it starts with a demand it can scarcely overtake within the next two or three years. It is supported by good men of business in London, and has a list of patrons, amongst whom we reckon the Earl of Lytton, Lord Lawrence, and Sir George Birdwood. Lord Lytton, with his well-known fine taste, has done a great deal to restore to the Punjab its fame for its carpets. The company now formed is one of those whose success cannot

possibly be in doubt. It meets a want in the Punjab, and a decided want on the part of the great communities of the West. We cannot but wish an honest and practical enterprise like this all success, and trust that where the Government can legitimately assist, it will not hesitate to do so.

### German Exports of Manufactured Goods.

The exports of German manufactured goods to places over sea, says a German Exchange, have not reached the extent this year which our exporters and manufacturers expected. In the first place the United States have not taken so large a portion of our manufactures as formerly; and especially have the transactions in clothing stuffs become smaller, the high import duties restricting trade, while fashion has been against German manufacturers. The Meerane trade suffers particularly in this connection, as it relies almost solely upon the export trade. Though there has of late weeks been an increase of activity at that place, the lack of large export orders is greatly felt. The increased cost of manufactured goods caused by the duty charge on raw yarn has in the foreign trade to be borne by the profits, so this is another prejudicial fact to take account of. In Central America there is a small improvement in trade, while the South American markets still suffer from excessive stocks. This is especially the case in La Plata, where quantities of goods have to be disposed of by auction. The reports from Brazil are not favourable. So long as the coffee and sugar trades there are depressed any decided improvement cannot be expected. There is a better trade in Mexico than formerly, our exporters having received from thence some large commissions. Complaints about the arbitrary interpretation of the Customs law continue to be made. Neither in Peru nor Chili has business recovered. The Asian markets bring only losses to the exporters of manufactured goods. The consignment of cloths to China has almost ceased, to the satisfaction of the old warehouses in Hong Kong. Imports are greatly neglected in the Dutch Indies on account of the sugar crisis. The general position of business in Australia cannot be regarded as unfavourable, but the direct trade with German manufactories has decreased, orders coming mostly by way of London. By over-sea importers and also by our manufacturers at home the want of commission houses in Germany is greatly felt, though Hamburg houses certainly cultivate the foreign trade more now than formerly.

### ODDS AND ENDS.

The Secretary of the United States Treasury has sent a circular to manufacturers and importers stating that the tariff laws are largely evaded by under-valuations, and asking them to give him their views about the advisability of simplifying the tariff by changing the *ad valorem* duties to specific duties, and also about the relative cost of manufacturing in America and in Europe. The information is asked in order that it may be transmitted to Congress for its assistance in improving the Customs system.

The *Daily Chronicle* says—"Some of the textile trades of Austria are just now in a condition of extreme depression. The cotton manufacturing trade is especially affected, in consequence of the recent over-production, which has left most of the manufacturers with very large unsaleable stocks on their hands. The cotton spinning firm of Trunan and Marienthal has just dismissed 400 of its workpeople, whilst another large firm of Tattendorf, that of Herr Nicolaus Dumbas, has discharged so many of its hands that the factory may almost be said to have ceased production. The depression is also shared by the carpet trade, and Herr Phillips Haas, one of the largest carpet manufacturers in the kingdom, is about to considerably curtail his production."

The Bank of Scotland is preparing for speedy issue an entirely new kind of bank note. It is to be in colours instead of the black and white of the Bank of England notes. The promise to pay in the body of the note is surrounded on two sides by a broad ornamental band, and on the other two sides by a border, in which the value of the note is printed an immense number of times. On one border the seal and counter seal of King William II. of Scotland are printed in brown on a yellow ground, and between them are the Royal Arms on a blue ground. On the upper border are the arms of the Bank in brown on a yellow ground, with the date (1695) of the establishment of the bank. The novelty of the note is, of course, in its colours, which will make photographic production impossible and, it is believed, will prevent forgery of notes. The paper on which the new note is printed is made by the makers of the paper on which Bank of England notes are printed.



### Nitrate of Iron.

Under this name are included a great variety of preparations, some of which contain nitric as their only acid; others nitric and sulphuric, in very various proportions; and others again a mixture of nitric, sulphuric, and acetic. Some are perfect per-salts of iron, but the majority contain proto-salts of larger or smaller amount. Some are made from scrap iron, some from copperas, and some from a mixture of the two. Some are prepared from pre-existing nitric acid (single or double aquafortis) whilst in others the iron is dissolved by nascent nitric acid liberated during the process by the action of sulphuric acid upon nitrate of soda. In strength, too, they vary from 40° Twaddle to upwards of 100° Twaddle. Yet so many and various are the purposes to which nitrate of iron is applied, that any one of these varieties may, for its own purpose, be pronounced of good quality. We have, in the first place, "blue irons," such as serve for printing or dyeing blues upon silk or cotton, with the aid of prussiate of potash. Blue irons should be sharper than irons for other purposes; if too "dead," that is, if the amount of iron be too great in proportion to the acid, a part of the Prussian blue formed will be deposited at the bottom of the dye-pan, and that which is fixed upon the goods will be dull, loose, and cloudy. Nevertheless, the nitrate of iron must not be too raw; if so, the colour will be thin and hungry, and the goods will be damaged by the free acid. If the article to be dyed be silk or cotton skeins, a blue iron made from copperas, and approaching very nearly to a pure per-salt of iron, will give results superior to those obtained with a true nitrate, from aquafortis and scrap iron. If piece goods with a cotton warp are to be dyed, the wool or worsted having first received its proper colour from one of the aniline blues, a blue iron made from copperas is not admissible, as it somewhat stains the worsted. If the shade required be a sky, or if it be for conversion into a green by the application of a yellow, a blue iron from hoop iron dissolved in nitric acid is advisable. But if a true royal blue is desired of a warm, bloomy tone, the best nitrate of iron is that prepared with nitrate of soda and sulphuric acid. Since aniline blues have been produced applicable to cotton, the use of "blue-irons" has very much decreased. Black irons, or those used for printing or dyeing blacks upon silk, wool, or cotton, in conjunction with galls, myrobalans, logwood, or some other ware containing tannin, require a different preparation. Thorough saturation is here of great importance, as raw acid tells a fearful tale both upon the goods and the colours. Yet there must not be more iron present than can exist in a true state of solution, and can be delivered in a regular manner to the fabric. If this limit be overstepped, the blacks will not only be uneven and blotchy, but they will, in all probability, be streaked and clouded with rust marks, where oxide of iron has been deposited upon the fibres without having combined with the tannin. Under most circumstances irons made from copperas are decidedly preferable to those made from the metal for black purposes. Nor is it essential that all the iron should be in a state of perfect peroxide. On the contrary, both theory and practice show that a fuller and bloomier black can be dyed with a nitrate of iron containing a proportion of protoxide. If the protoxide be too small in amount, the black produced will be brownish; if too large, it will have too blue a tone. In some cases a quantity of brown sugar of lead is added to black nitrate of iron. By this means a portion of the sulphuric acid derived from the copperas is removed, forming an insoluble combination with the lead, which gives up acetic acid to take its place. The most difficult variety of nitrate of iron to prepare successfully is "burling iron." It is used to dye the spots of cotton remaining uncoloured in black woollen cloths. The margin here is exceedingly narrow; a very slight excess of acid will damage the colour on the wool, and similarly a slight excess of iron will inevitably disfigure the pieces with rusty blotches. A nice balance must likewise be preserved in irons for printing purposes. If too raw and acid, the doctors and copper cylinders of the printing machines are damaged, often to a serious extent. The finished goods if not subject to a final rinsing off are very apt to be corroded. The greatest freedom

from corrosiveness is required when unwoven cotton warps are printed. A third class of nitrates of iron are the "common" or "saddening," such namely as are used in drabs, browns, clarets, etc. These require to be rather sharper than the black qualities, so that the combination they form with the sumac or galls, etc., may be faster, and able the better to withstand subsequent treatment with alum or preparations of tin. They should be as nearly as possible perfect per-salts of iron, and may be made either totally from copperas, or may contain a mixture of such and of metallic iron. Muriatic acid should never be added in the manufacture of nitrate of iron. The nitric acid used should be free from this impurity, and the nitrate of soda should be purified from chloride of sodium as far as possible. The reason is not merely that muriatic acid retains the iron it has taken up more tenaciously than nitric acid, but that, in dyeing mixed goods, it delivers the iron upon the worsted instead of upon the cotton. For the examination of samples of nitrate of iron, the following directions may be given. Dilute with distilled water, adding sufficient pure hydrochloric acid to prevent subsalts of iron from being thrown down, then add a solution of chloride of barium. A white precipitate shows the presence of sulphuric acid either added as such or in the form of copperas. Add to a small portion of the sample pure ammonia, till all the oxide of iron has been precipitated. This is then filtered off, and the clear liquor evaporated down to dryness, and the residue heated to redness in a small porcelain capsule. If any fixed matter remain, the sample has been got up with nitrate of soda. Dilute a portion with distilled water, add a little pure nitric acid to prevent turbidity, and then add a solution of nitrate of silver. A white curdy precipitate indicates the presence of muriatic acid. To ascertain whether any portion of the iron is in a state of protoxide, drop in cautiously a solution of carbonate of soda. If the sample be a pure peroxide, the precipitate will be of a uniform pale yellow. If any protoxide be present, clouds of a greenish colour appear in the liquid. Or a dilute solution of the red prussiate of potash may be added, which, if any protoxide exist in the sample, will give a blue precipitate. To find the comparative acidity of two samples of nitrate of iron, measure of equal volumes of each, and drop carefully into each of them, from a burette, a standard solution of carbonate of soda, till the exact point is reached, when the liquid no longer reddens blue litmus paper. The number of degrees of the burette consumed in each case will show the relative acidity of the samples. Of course, only samples which mark the same specific gravity or degree on the hydrometer are thus comparable. If they differ, the stronger must be let down with water to the same degree as the weaker, and equal measures of each are then taken. The brightness, fastness, and evenness of the shades given by different samples can only be judged by dyeing swatches of calico, or skeins of cotton. For blue irons, equal weights of perfectly clean calico are steeped in equal measures of the samples under comparison, each previously diluted with an equal quantity of cold water for equal times. They are then lifted, allowed to drain, and steeped for equal times in equal measures of water, to each of which an equal quantity of a solution of prussiate of potash is added. The swatches are then lifted, rinsed, dried, and compared. Black irons are tried as directed under Divi-divi, preparing the swatches with some astringent, and then steeping them in the respective samples of nitrate of iron under examination. Saddening irons may also be tried in precisely the same manner, only after being taken out of the iron liquor the swatches are each steeped in a solution of alum. That which, after this treatment, looks fullest and brightest, receives the preference.—*Slater's Manual of Colours and Dyewares.*

### Silk.—Combing and Spinning.

(Concluded from Page 3.)

The first process that silk undergoes when it enters the mill is thoroughly washing it in small bags until it is clear of all dirt, and then it is dried at a good heat; it is next put through what is called a filling engine. The principal part of this machine is a large cylinder, about four feet in diameter. Upon this cylinder is placed a certain number of combs, according to the class of silk that is to be operated upon, some having ten, fifteen or twenty combs. These combs are placed at intervals around the cylinder. At the back of the machine is a pair of porcupines or rollers, full of sharp teeth; the



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AND

## Textile Industries.

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### Notices.

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### Museum for Trade Patterns.



CORRESPONDENT (Mr. Ablett) writing to the *Manchester Guardian* on the subject of Museums of Trade Patterns and Industrial Examples, says that having some years ago endeavoured to awaken sufficient interest in London to cause the matter to be taken up by the authorities at South Kensington, the City Guilds, &c., and finding the public not prepared to carry out the suggestions, he turned his thoughts to Manchester, where he resolved to endeavour to found a Textile Museum which should include specimens of woven and other textiles, raw textile fibres, models of machinery, and manufacturing appliances, all classed and arranged under appropriate divisions. Having journeyed to Manchester with this object in view, Mr. Ablett says:—"I stayed three months and began to form the nucleus of a museum, and issued a monthly publication called the *Practical Manufacturer and Journal of the Manchester Museum of Trade Patterns*, but as I obtained no material help from anyone, though full of

faith in its being ultimately approved and adopted, I had to give it up, being unable to sustain, as a private individual with but narrow means, the expenses of an effort which demanded an outlay such as could be borne only by an association or by a municipality. The hope sustained me that what I was then doing would, in its way, be as practically useful to my fellow countrymen engaged in manufactures as the Sunday School scheme of Raikes proved to be to religious and secular elementary education. But it is a hard matter to produce an impression upon the British public, unlike the French, who are charmed with "ideas," and enthusiastically carry them out to their practical termination. I have visited every town throughout Great Britain wherein any textile manufacture of importance is carried on, and I unhesitatingly affirm that there is not one in the United Kingdom where the standard of manufacturing skill, invention, and design could not be immeasurably raised by the presence of such an institution in its midst. The main idea of late in imparting technical instruction seems to be through the giving of lectures. I certainly am not disposed to undervalue these, and especially when given in connection with chemistry and natural laws; but it is very clear that the teacher cannot go beyond what is already known to some; and what we need is further advances, so that it is not from the black-coated professor that extended knowledge is to be gained, and fresh fields struck out in actual manufacture, for he can only speak of the facts or conditions of matters up to that standpoint which exists and is common to the most experienced persons in any given branch, and here he stops, and his hearers with him. But the practical manufacturing hand, be he master, overlooker, or first-class workman, gets a new idea from something he sees in a museum, and he makes an addition to it—strikes out something fresh and causes a new departure,—and it is the practical man, and not the theoretical one, to whom we must look for new inventions, fresh combinations, and general improvements in manufacture; and while many schemes and plans might be suggested for the acquisition of enlarged technical knowledge, nearly all, if not quite all, would take a considerable time to develop; while the system I advocate would enable men to teach themselves at once what they need to aim at, because each could apply to his own circumstances the lessons which might thus be gained. No manufacturing centre can be regarded as completely equipped, so far as its public arrangements in connection with the acquisition of technical knowledge are concerned, till it has acquired its "Kunst Gewerbe," as they are called in Germany—art industries—which there abound, and also in Switzerland—at Berne, Zurich, St. Gallen, Basle, and Winterthur, the "Museum für Kunst und Industrie," at Vienna, the Landes-generbehalle in Karlsruhe, one of the finest collections in the world. France has taken up this movement upon a large scale in recent years, but there have long been such establishments in Lyons, St. Etienne, and other places. The *Dépôt des Lois*, No. 1,284, *Chambre des Députés*, Session 1879, contains a "Proposition de Loi sur l'organisation des musées d'art industriel," in the Budget of the same year the Chamber voting one million francs for this purpose. 'During a recent visit to the Continent,' writes Professor Charles U. Yates, of University College, Nottingham, "I paid special attention to these questions, and had frequent conversations with the leading manufacturers in different towns concerning this subject. From Germany, through Austria, Switzerland, France, and Belgium, I only heard one opinion; I was invariably told that the trade museums were not only a great benefit, but many men considered them indispensable. Such testimony, combined with the recommendations of our Commission on Technical Education, should open the eyes of our people. Nottingham, above all other places, stands in need of such an institute, and sooner or later we, and other places as well, shall be obliged to take some steps in this direction.' To the details of such museums I have not, of course, alluded, but the cursory mention I have made of the scheme will indicate its outlines, the filling in of which must be left to local superintendence and direction. But I may add that in the history of manufacturing progress it is well known how often men are at a loss for the commonest contrivances to ensure a certain description of work, or result, that are well known and simplified elsewhere. Under these conditions such an institution, in the midst of any industrial centre, would become the foster-mother of inventive design."



### Receiving Orders.

Archer, C., 84, Outgang Lane, Radford, Nottingham, lace manufacturer.  
Edge, J., Ball Haye Green, Staffordshire, silk manufacturer.  
Patchet, A., Prospect Terrace, Bradshaw, Yorkshire, worsted manufacturer.

### Adjudications of Bankruptcy.

Archer, C., 84, Outgang Lane, Radford, Nottingham, lace manufacturer.  
Patchett, A., Prospect Terrace, Bradshaw, Yorkshire, worsted manufacturer.  
Turner, J., 122, Coltham Street, Kingston-upon-Hull, wool broker.

### Dividends.

Mulholland, C. J., Carlton Road Nottingham, lace dresser, 8s. 6d. (first and final). Offices of the Trustee, Mr. Henry Hubbard, chartered accountant, 6, Thurland Street, Nottingham.

### Dissolutions of Partnership.

Acheson, R., J. Life, and W. Lockitt, 51, High Street, Manchester, general woollen merchants.  
Buckley, J., J. Stott, and Mary Butterworth, Oakenrod, Rochdale, cotton spinners.  
Fairbrother, T., J. Comery, and E. Wright, Long Eaton, Derbyshire, lace manufacturers.  
Hathan, J. and E. Hathan, Wheelock Road, Sandbach, Cheshire, silk throwsters.

### PATENTS.

#### Applications for Letters Patent.

Appliance to prevent formation of a lap on the drawing off rollers of a combing machine. W. H. Greenwood and F. Farrar, Bradford. 6th July 8,150  
Actuating the healds or harness of power looms. A. Sowdon, Bradford. 6th July 8,155  
Apparatus for bleaching purposes. A. Whowell, London. 13th July 8,443  
Actuating dabbling brushes of combing machines. E. Bray and J. Heald, Leeds. 14th July 8,502  
Arrangement of picking stick and strap connected with the picking arrangement of looms. G. Bartle and T. Myers, Wilsden. 22nd July 8,845  
Breaking flax and other fibrous stalks. H. J. Haddan, London. 4th July 8,124  
Bleaching vegetable textile fabrics. W. Mather, London. 21st July 8,794  
Carding engines. J. Elce and T. S. Whitworth, Manchester. 3rd July 8,069  
Covers of carding engines. E. Tweedale, Halifax. 4th July 8,110  
Combing cotton, silk, &c. J. Dugdill, Manchester. 11th July 8,378  
Connecting fasteners to all kinds of driving belts. J. Jackson, Glossop. 13th July 8,431  
Connecting cards employed in Jacquards. S. Tebbutt, London. 15th July 8,545  
Chenille thread. C. A. Day, London. 17th July 8,670  
Combing wool, cotton, &c. J. W. Bradley, Bradford. 27th July 9,034  
Covers of the fancy rollers of carding engines. R. Slack, Manchester. 30th July 9,140  
Driving belts, bands or straps. J. Moxon, Sheffield. 30th June 7,897  
Doffer comb for carding engines. J. Elce and T. S. Whitworth, Manchester. 3rd July 8,070  
Dobbies or shedding motions. R. Eckroyd, London. 3rd July 8,090  
Driving belts and ropes. H. J. Haddan, London. 23rd July 8,907  
Embroidery laces. J. Krusi, London. 30th June 7,931  
Fire-proof flooring for mills and other buildings. A. H. and J. A. and A. H. (Jun.) Stott, Manchester. 1st July 7,967  
Fustians. J. Schofield and A. Taylor, Manchester. 2nd July 8,021  
Fabric made on twist or Lever's lace machines. H. Hitchin, London. 2nd July 8,052  
Fancy or such like looms. A. G. Brookes, London. 3rd July 8,083  
Finishing cut-pile or other fabrics. J. Clarke, Oldham. 6th July 8,157  
Finishing the piled surface of welt piled fabrics, as velvets, &c. S. and T. Crabtree, Manchester. 14th July 8,496  
Fastening for driving belts. E. Edwards, London. 17th July 8,665  
Figured terry or looped fabrics. W. Warrington, Manchester. 28th July 9,049

Fasteners or couplings for driving belts. W. R. Lake, London. 28th July 9,074  
Gassing yarns. J. W. Dawson, London. 1st July 8,016  
Holding-down spindles for spinning or doubling fibres. J. Macqueen, Manchester. 24th July 8,920  
Jacquard harness for weaving leno and gauze fabrics. I. Thomas and M. Priestley, Bradford. 10th July 8,355  
Lace and other window curtains. F. H. Goodyear, London. 7th July 8,243  
Lace curtains. R. F. Carey, London. 22nd July 8,862  
Mule spinning machinery. J. and N. Greenwood, and J. Gledhill, Halifax. 7th July 8,220  
Manufacture of Brussels, Wilton, or other carpets, rugs, &c., which are, or may be woven in the jacquard loom. G. W. Oldland, Birmingham. 22nd July 8,831  
More effectually cleaning cotton, &c. M. Garfitt, Oldham. 23rd July 8,892  
Operating the healds of looms. C. Hahlo, C. E. Siebreich, and T. Hanson, Halifax. 23rd July 8,878  
Pulleys or drums. C. Longbottom, Bradford. 7th July 8,206  
Process of treating and weighting silk. J. C. Siegerist, Manchester. 23rd July 8,890  
Preparing cotton, &c., for spinning. G. P. Leigh, Manchester. 30th July 9,136  
Reeling and winding frames. W. Noton, Manchester. 6th July 8,149  
Relating to lubrication and cleaning of spindles in spinning, &c. machinery. T. H. and H. Blamires, Manchester. 14th July 8,489  
Removal of vegetable impurities from wool by chemical means in combination with steam. C. D. Abel, London. 21st July 8,795  
Retarding or arresting the rotation of the spindles in preparing, spinning, and doubling machinery. P. and R. and J. Eadie, Manchester. 23rd July 8,914  
Spinning textiles. W. Noble, Manchester. 30th June 7,899  
Slubbing, intermediate and roving frames. S. A. Luke, Leeds. 30th June 7,926  
Self-acting mules. J. Threlfall and J. Pickles, London. 1st July 8,007  
Stop-motions for reels, combers, carding engines, &c. B. A. Dobson and J. Hill, Manchester. 2nd July 8,024  
Spindles and partition plates for spinning and twisting wool, &c. W. Turner, Halifax. 2nd July 8,025  
Singeing and dressing woven fabrics, and apparatus. A. Entwistle, Manchester. 4th July 8,105  
Shedding motion for looms. C. Bedford and T. Kershaw, Halifax. 6th July 8,144  
Split pulleys and warp beams. H. Underwood and C. Schweizer, New York. 6th July 8,166  
Steaming woven fabrics. J. Hawthorn and J. P. Siddell, Manchester. 7th July 8,200  
Spinning, slubbing and roving frames. A. Dilthey, Manchester. 7th July 8,210  
Scutching fibrous stems, leaves, &c. W. E. Death, London. 13th July 8,464  
Spinning and doubling fibres. J. Hall, Halifax. 15th July 8,547  
Spinning. T. H. Briggs, Bradford. 21st July 8,768  
Strap forks or belt guides. W. W. Cobbett, London. 21st July 8,791  
Spinning and doubling machines. J. W. Shepherd, W. Ayrton, and C. Siddall, Manchester. 25th July 8,977  
Shuttle boxes of looms. N. Wood and W. Harris, London. 25th July 8,983  
Scouring wool. C. Toppan, London. 28th July 9,043  
Spooling machines. J. Balderston, Glasgow. 28th July 9,061  
Spinning and doubling frames. R. T. Gillibrand, London. 29th July 9,110  
Shearing or cropping woven fabrics. D. Bailey, Halifax. 30th July 9,142  
Treading, picking and letting off motions of looms. R. L. Hattersley and J. Hill, Keighley. 4th July 8,109  
Treating textile materials with liquid, gases or vapours. W. Mathers, London. 21st July 8,793  
Treatment of vegetable fibre for the production of half stuff and other purposes. W. B. Nation, London. 21st July 8,808  
Testing canvas and other materials. J. F. O'Connor, London. 29th July 9,131  
Uniting the edges of knit or other looped fabrics. J. G. Wilson, Manchester. 1st July 7,988  
Woven fabric for covering floors or walls, &c. F. Bolton, London. 1st July 8,009  
Winding and reeling cotton, &c. J. W. Makant and P. Parkinson, London. 1st July 8,099  
Whirl for spinning purposes. W. Skeet and G. Asher, Birmingham. 11th July 8,398  
23rd July 8,891

#### Patents Sealed.

7,896	9,231	9,495	9,740	9,989	2,019	3,699
3,734	3,748	3,788	8,158	9,604	666	922
9,755	10,099	9,778	10,284	10,640	3,506	4,003
7,789	9,802	10,578	10,720	10,042	9,606	9,701
9,751	10,519	10,649	2,421	2,800	10,147	10,796
10,868	10,880	11,268	4,689	4,766	4,767	4,768
9,295	10,692	10,881	10,893	10,915	10,988	11,140
11,211	11,291	11,975	16,013			





## Mill Architecture.

(Continued from Page 16.)



**IRE-DOORS.**—There are few parts in fire construction which are of so much importance, and generally so little understood, as fire-doors. Instances of the faulty construction of these, even by good builders and architects, may daily be seen. Iron doors over wooden sills, with the flooring boards extending through from one building to the other, are common occurrences. We frequently find otherwise good doors hung on to wooden jambs by ordinary screws. Sliding doors are frequently hung on to wood-work, and all attachments are frequently so arranged that they would be in a very short time destroyed by fire, and cause the door to fall. In case of fire, a solid iron door offers no resistance to warping. In an iron-lined door, on the contrary, the tendency of the sheet iron to warp is resisted by the interior wood, and when this burns into charcoal, it still resists all warping tendencies. I have seen even heavily braced solid iron doors warped and turned after a fire, having proved themselves utterly worthless. It is needless to say that when wooden doors are lined, they should be lined on both sides; but frequently we find so-called fire-proof doors lined on one side only. Good doors are often blocked up with stock and other material, so that in case of fire they could not be closed without great exertion, or they have been allowed to get out of order, so that in case of fire they are useless. The strictest regulations should exist in regard to closing the fire doors nightly. Frequently we find that although the fire-door and its different parts are correctly made, there are other openings in the wall which would allow the fire to travel from one building to the other, such as unprotected belt and shaft-holes. That a fire-door may be effective, it must be hung to the only opening in the wall. The greatest care must be exercised to keep joists from extending too far into the wall, so as not to touch the joists of the adjacent building, which would transmit the flames from one building to the other, in case of fire. A good stone sill should be placed under the door, and the floor thereby entirely cut. Sills should be raised about one and a-half inches above the level of the floor, in order to accomplish the necessary flooding of the same. If stock must be wheeled from one building to the other, the sill can readily be bevelled on both sides of the wall, allowing the wheels to pass readily over it. Lintels should consist of good brick arches. When swinging doors are used, they should be hung on good iron staples well nailed into the masonry, and the staples so arranged that the door will have a tendency to close by its own weight. The door should consist of two layers of good one and a quarter inch boards nailed cross-wise, well nailed together and braced, and then covered with sheet iron nailed on, or, if of sheet tin, flanged, soldered, and nailed. Particular care should be taken to insert plenty of nails, not only along the edge of the door, but cross-wise in all directions. I have seen cases, in which nails had only been placed along the edges, where the entire covering had been ripped off through the warping tendencies of the sheet iron. The hinges on these doors should be good strap hinges, tightly fastened to the door by bolts extending through it, and secured by nuts on the other side. Good latches, which keep the door in position when closed, should always be provided. In no case should the door be provided with a spring lock, which cannot be freely opened, as employees might thereby be confined in a burning room. Sliding doors should be hung on good wrought-iron run-ways, fastened tightly into the wall. Wooden run-ways, iron-lined, which we frequently see, are not good, as the charring of the wood in the interior causes them to weaken and the doors to drop. Run-ways should be on an incline, so that the door when not held open will close of itself. Care must be taken to have a stop provided in the run-way, so that the doors may not, as I have frequently seen them, over-run the opening which it is to protect. Doors should overlap the edges of the openings on all sides. Large projecting jambs should never be used. All doors contained in "fire-walls" should have springs or weights attached to them, so as to be at all times closed. Fire-doors can be shut automatically by a weight, which is released by the melting of a piece of very fusible solder employed for this purpose. So sensitive is this solder that a fire-door has been made to shut by holding a lamp some distance beneath the soldered link, and holding an open handkerchief between the lamp and link. Though the handkerchief was not charred, hot air enough had reached the metal to fuse the solder and allow the apparatus to start into operation. These solders are alloys more fusible than the most fusible of their component metals. A few of them are—Wood's alloy, consisting of:—Cadmium, 1 to 2 parts; tin, 2 parts; lead, 4 parts; bismuth, 7 to 8 parts. This alloy is fusible between 150° and 159° Fahr. The fusible metal of d'Arcet is composed of:—Bismuth, 8 parts; lead, 5 parts; tin, 3 parts. It melts at 170° Fahr. We can, therefore, by proper mixture, form a solder which will melt at any desirable temperature. Numerous devices for closing doors automatically have been constructed, all depending upon the use of the fusible solder catch.

**PICKER-HOUSES.**—The proper construction of that hazardous part of a mill, the picker-house, is of the utmost importance. Frequently we find picker-houses, otherwise well constructed, with some fault which endangers the whole structure. Glass transoms above iron doors, between the main mill and the picker-house, may sometimes be seen, while large belt-holes in the protecting wall are very common. These will readily convey fire from the picker-room to the mill. It is difficult to protect belt openings by iron slides. It is therefore better to have power conveyed from the mill to the picker-room by means of shafting. When journal-boxes are set in the wall, small apertures only are required. A frequent mistake in picker-houses is to leave the windows in the wall of, the main mill above

picker-house unprotected by iron or iron-lined shutters. Picker-houses are generally one story high, and the flames striking upwards are thereby communicated to the mill. The ventilators and sky-lights in the roof of the picker-house increase the danger from these sources. Windows in the picker-house, facing the mill, may also frequently be found. These, if possible, should be dispensed with. If they are absolutely necessary, good iron lined shutters should be provided, which should in all cases be arranged to close from the outside. Brick, stone or cement, floors should be used in the picker-house. Wooden window-jambs and casings should not be used; while substantial iron, or, better still, iron-lined shutters (for solid iron shutters have the demerits of iron doors) should be hung over all openings extending beyond the edges of the windows. A shutter should be constructed like an iron door, hung on good iron staples built into the wall, and always on the outside of the building. Shutters hung on wooden window casings will, of course, fall as soon as the wood-work is destroyed. Iron shutters should never be placed on the inside, as it is absurd to expect that any one will remain inside a burning building to close shutters. **CARD-ROOMS.**—The card-room should be as large and as well ventilated as possible. The ceilings should be high, and should contain as few projections as possible, as these will cause the "fly" to settle on them. The card-room should be wide enough to allow the placing of the cards in sets side by side, with sufficient space between the sets to allow the cleaner to pass freely around them.

**TRANSMISSION OF POWER.**—All driving fixtures should be contained in separate houses, constructed like a stairway or elevator-house, cut off from the mill by coped-fire walls, as a fire will be carried from story to story through belt openings and boxes. Particular attention should be given to belt boxes, where they are used, to keep them at all times scrupulously clean from waste fly and so on. Belt boxes should be provided with a good supply of automatic sprinklers. Objections have been raised to sprinklers by some, for the reason that they should be opened by accident, the belts would be damaged by water. Mr. Edward Atkinson has suggested that the belts be enclosed in a glass chamber, and that automatic sprinklers should be placed outside the glass. This arrangement, I understand, has worked well in practice. All dangerous journals throughout a mill should be provided with automatic alarms, which give a signal as soon as a journal becomes dangerously hot. One of the best, the Journal Thermostat of Whitaker, consists of a U-shaped glass tube, with arms of equal length, one of which is closed. The left arm contains a small amount of a volatile liquid hydro-carbon, and the remainder is filled with mercury. When the temperature of the journal rises beyond a certain point, the hydro-carbon is vaporized, and forces out the mercury, which, in collecting in the receptacle below, closes an electric circuit, which gives the alarm.

**HEATING.**—The old primitive method of heating by stoves is rarely found in the better class of mills. Where these are used, care should be taken that they are placed on metal, with good stove pipes passing into chimneys, the stove-pipes being tightly wedged into the wall, so as to keep them from disengaging and allowing sparks to fall into the room. Under no consideration should stove-pipes pass out of windows. The safest system of heating is by hot water. In this case, the heat is produced by radiation from pipes filled with hot water, the same being heated in a boiler, preferably outside the mill. Steam is usually employed for heating in mills. Special care should be taken to have the pipes free from wood-work, and away from all places where dust, dirt, waste, &c., may accumulate. Steam pipes should be hung along the ceiling, about 24 inches below it, in preference to the old fashion, along the sides of the room, where stock and waste are frequently piled. The theory, so frequently advanced, that, if pipes be hung below the ceiling, the same amount of heat cannot be obtained as when they are hung along the sides, is erroneous. The following table, which shows the results of a series of experiments made by Mr. C. J. H. Woodbury, demonstrates this fact. Hourly thermometrical observations were taken in a room, 75 x 400 feet, supplied with five rows of steam pipes, against the walls near the floor, in the first instance; and in the second there were four rows of pipe around the room, two feet from the walls and hung the same distance below the ceiling, requiring only three-quarters as much pipe as in the first instance.

Mean Temperature by Hourly Readings.

Thermometer hung in centre of room.	Degrees Fahrenheit.	
	Pipes at side. Dec. 29 to Jan. 5.	Pipes elevated. Jan. 29 to Feb. 5.
Sixteen inches from ceiling .....	80°00'	80°80'
Midway .....	76°52'	76°90'
Sixteen inches from floor .....	77°08'	77°00'
Average .....	77°88'	78°23'

The reasons why steam pipes ignite wood are two-fold. First, in the case of superheated steam, we have a regular combustion going on; in the second case, with steam pipes containing steam, at the usual temperature, we have a secondary phenomenon of spontaneous combustion. In the latter case, the steam pipes slowly dry the wood, the contained moisture being vaporized, and at last the wood assumes a state resembling that of charcoal; when in this condition, combustion may take place spontaneously. At a discussion before the French Academy in 1879, this was brought out clearly. M. Cosson described an accident which had occurred in his laboratory a few days before. While the narrator was working in the laboratory, a portion of the boarding of the floor spontaneously took fire. The boards were in the vicinity of an air-hole, fed with warm air from a stove four metres away on the floor below. A similar accident had occurred two years ago, and in consequence M. Cosson had the boards adjoining the air-hole replaced by a slab of marble. The boards which now ignited adjoined the marble. The heat to which the boards were subjected was, however, very moderate, being only that of air at 25°C. (77°F.). Nevertheless, M. Cosson said the wood had undoubtedly been slowly carbonized. Being thus ren-



## The Influence of Different Atmospheres upon Weaving Cotton Warps.



HERE would seem to be no doubt entertained, by those who have given this subject careful attention, that the state of the atmosphere exercises a considerable influence on the weaving qualities of cotton yarns. Even amongst those who have not given this question any particular attention, this fact is very generally accepted. We hear, too often, certain loom sheds styled as bad weaving places, and too many complaints are made about the quantity and the quality of the work produced during the prevalence of dry easterly winds, and during the frosts in winter, to doubt the correctness of this contention. With this fact so generally recognised, it seems strange that manufacturers should, as a body, have given so little attention to the subject—should have expended capital in building, or purchasing, weaving sheds, without first having become acquainted with the natural laws which govern the weaving of yarn in respect to atmospheric changes. These laws would seem to be far more honoured in the breach than in the observance. When a weaving concern is put down, the suitability of the situation in this respect is seldom, if ever, considered, and when the plans for the shed are drawn out, everything else seems to be considered except this most important point. East winds and frosts we shall always have to face, and those who intend to hold their own in these days of keen competition, will find that it will be necessary to put a stop to the losses sustained through their occurrence. One point we desire particularly to impress upon our readers, viz.:—that whenever the atmosphere of a weaving shed is higher in temperature than the atmosphere outside the shed, the quality of the weaving must be deteriorated, unless some means are employed to introduce into the atmosphere of the shed more moisture. In damp weaving sheds (and these are the sheds renowned for good weaving qualities), this extra moisture is, partially, if not wholly, absorbed from the damp floors and walls, but, as many of these sheds are much damper in one section than in other sections, great annoyance is often caused by the fact that, whilst the yarn in one part of the shed is weaving properly, the yarn in some other part does not weave so well. The emission of steam into the weaving sheds has been very largely adopted in Lancashire in order to supply the necessary extra moisture, but this seems to be not only an expensive, but, also, a clumsy method, and one in which elements exist which prevent it from being a perfect remedy, because, whilst supplying extra moisture, it also heats the atmosphere in the shed still further, and the higher the temperature of the atmosphere is, the more moisture is required. We will endeavour to explain how this is. All cotton and all cotton yarn contain in themselves water or moisture, and in all cases where this natural moisture is extracted, one result alone ensues, viz.:—the fibre of the cotton and each thread of the yarn become weaker, and this to a most alarming extent. When the natural moisture in the yarn is reduced one half, the yarn loses about one third of its strength. It is also found that when the natural moisture is artificially increased, the strength of the yarn is augmented, although not in anything like the same proportion. It is evident, therefore, that in order to ensure the best possible results from the warps supplied to the weavers, the natural moisture contained in them must not be reduced, but must, if anything, rather be augmented. It is also evident that, to attain this result, it is necessary not only to see that the temperature of the shed is kept regular, but that the moisture contained in the atmosphere is sufficient. These two points must always be considered in conjunction. The variations in temperature are easily ascertained by thermometers made for that purpose, and a simple instrument called the hygrometer will indicate the amount of moisture present at any given time. It is considered in Lancashire that 65 degrees is about the best heat for a weaving shed, but it must not be forgotten that if the atmosphere in a shed is 65 degrees, say, at six feet from the ground, it will be considerably higher at the ceiling. It is the hot air that always escapes from the shed first, and its place is supplied by air from the outside. As the air which thus enters is only of a temperature of from 50 degrees to about 55 degrees during the autumn, winter, and spring, it consequently robs the yarn of its moisture when it is being heated. Most sheds contain outlets for the used-up hot air, but even in those where no such outlets are arranged for, the hot air escapes through many thousand small cracks, &c. In this article we propose, first, to show how the temperature and atmospheric moisture may be best regulated, and afterwards to indicate what situations are, as a rule, most suitable for the location of a weaving shed. In dry weaving sheds, the only time when the atmosphere, under any conditions not artificially created, adds strength to the yarn, instead of robbing it, is when the outside atmosphere is of a higher temperature than the atmosphere in the shed. How often, during twelve months, does this occur? We are afraid, but seldom, so that it is necessary, in order to attain the end in view, to resort to artificial means. To our mind, the only really practical method is by the introduction of warmed and moistened air. There are two ways by which this is at present being done. The first is that by which the warmed and moistened air is by a fan driven into the shed, and the other is that in which the air in the shed is withdrawn by means

of an air extractor, or air extractors (according to the size of the sheds), arrangements being made for the air, which is required to replace the air withdrawn, to enter into the shed through inlets so constructed that the air, during its passage, can be either warmed or moistened, or both. Which of these two systems is the better depends so much upon the construction of the shed, that we cannot say more than that both systems, in the hands of careful men, have been found to answer. For sheds where Jacquard machines are used, the latter system seems preferable, as the moistened air introduced by that system has not necessarily to descend from the higher part of the shed, and, therefore, has not the same risk of making the harnesses clammy. The arrangements under both systems are easily controlled, a turn of two, or at most three, valves increasing or decreasing both the temperature and the moisture of the air. Mr. Lacy, of Todmorden, was the apostle of these systems we have mentioned, and he patented the machine which drives the heated and moistened air into the shed by means of a fan. The patent has since passed into other hands. The air could be warmed by being passed over steam pipes, and moistened by being blown through hot or cold water. From the machine in which the air is thus treated, the latter is conducted through one or more pipes which run the whole length of the shed, and which are placed about 8 feet from the ground. On these pipes are a number of revolving distributors, which admit the air into the shed. The machine only works when the engine is running. The second system works even when the engine is stopped, though, of course, the same quantity of air will not pass through the inlets, as the air extractors will not then be working, but as the temperature generally falls from five to ten degrees during the night, the air necessarily contracts in bulk; an admission of air is required from the outside to fill up the void. It is of no little advantage, to our mind, to have arrangements by which the air thus introduced shall be treated after the manner described. Now, as to the most suitable situations for building a weaving shed. Perhaps it will be well to state where a shed should not be built. First and foremost, it should not be built upon a hill, as the atmosphere of such a situation is drier than the atmosphere in a valley. Then it should not be built so as to be exposed to east and north winds. It should not be built on a site which is one half clay and the other sand, as one part of the shed will be damp and the other dry, and it should not, for the same reasons, be built so that one part of the site has to be excavated out of the hill side, whilst the remainder of the site is composed of "filled up" material. And we would state, in passing, that the shed should not be loftier than the requirement of the goods manufactured and the driving straps require. When either of the arrangements indicated in this article is employed, more fresh air is given to the operatives working in a low shed than would be given to those working in the loftiest, where no such arrangements existed. The best situation for a shed, in order to secure good weaving without any artificial assistance, is a narrow valley running north and south. The walls should face east and west, being built as it were into their respective hill-sides. These walls should also be longer than the walls facing north and south. All windows should face due north, so that the sun may not make the shed unduly hot in the summer time. Where, however, a shed is to be supplied with arrangements by which the atmosphere may be artificially moistened, such a situation, which is often found inconvenient on account of carting, &c., need not be chosen. It is then only necessary to see that the subsoil of the site chosen is of one character, that the shed is as little exposed as possible to the east and north winds, and that the shed is built as low as the requirements will admit. One or two sheds have lately been built in Lancashire which commend themselves on account of being much cooler in summer and warmer in winter than the common type. These sheds have flat roofs made of iron beams and concrete, with asphalt over, so that water can be allowed to remain on the roof all the year round. The windows are made after the style of dormer windows, and are placed about every twelve or eighteen feet in each bay. It was thought at first that there would not be sufficient light with these windows, but for plain looms there was found to be ample. We are not aware that fancy looms have ever been worked in a shed of this construction. Since iron girders can be purchased at such a low figure, and concrete work has every year become better known and less costly, it seems strange that this type of shed does not multiply. When the advantages become better known, we shall probably see some alteration in this respect. The temperature in such a shed has been known during hot summers to be no less than 10 degrees lower than that in a shed adjoining, built upon the old principle, and the temperature during the summer time was constantly lower than the temperature of the air outside, considerably increasing the strength of the yarn, as we have before had occasion to mention. We are assured that, with the appliances lately put before the trade, both the temperature and the moisture contained in the atmosphere of a shed can, with little trouble, be so regulated that any very great variations need not occur, and we feel convinced that this has only to be more widely known by manufacturers in order that advantage may be taken of their assistance. We have remarked the strong feeling that has been in the past exhibited by the operatives against the emission of steam into weaving sheds; we believe this feeling still exists, and will, doubtless, when trade improves, find expression in further agitation. Should such agitation lead to strikes, it may not be unwise for manufacturers to consider whether they cannot attain their requirements in some other manner, which, whilst far superior for the manufacturers' purposes to the arrangement objected to, does not raise opposition on the part of their operatives.



show this, or of an undisturbed portion of its secreted silk." Mr. Cambridge has been kind enough to send me five other specimens of spider-silks. I have not been able to do more than to examine the diameters of their fibres, which are as follow:—

	Diameters of ultimate fibres.
Egg cocoons of the <i>Epeirida</i> sp. . . . .	70000 inch.
Egg cocoons of <i>Meta menardi</i> , Latr. Devonshire . . . . .	40000 "
Nest of <i>Uroctea Durandii</i> , Walck, Palestine . . . . .	30000 "
Silk of <i>Nephila plumipes</i> , Koch, United States, America . . . . .	70000 "
Egg cocoons of <i>Voconia maculata</i> , Kays, N. Corrientes, La Plata . . . . .	100000 "

There does not seem to be much prospect of any successful reeling of any of the species of spider-silk, but it is quite within the limits of possibility that they may be produced in such quantity as to be useful for being carded and spun, and if so, there will no doubt be a considerable utilisation of them. Short of a thorough analysis of the spider-silks, which I have not yet had opportunities of making, it seems to possess, to all appearance, all the physical properties of mulberry silk. It certainly has a central axis of silky matter, probably fibrin, and also an external coating of "gum," or "grès," or varnish, like silk, probably to protect it from the action of the weather. Dr. Bowman, in his first lecture on "The Structure of the Wool Fibre," at the Bradford Society of Dyers and Colourists, on January 22, 1885, states that silk fibre consists of three parts—a central silk cylinder forming the principal part of the fibre, outside this, a layer of albumen, and on the surface of this, a thin coat of gelatine. I have not been able to confirm this, and cannot go beyond my observations, which at present limit my conclusions to there being only a central substance of the fibrin, coated with what is technically termed in England "gum," and in France "grès," the gum constituting from 25 to 30 per cent. of the original weight of the silk, and being entirely removable by the necessary operation before dyeing, of boiling the silk in a solution of soap. In the case of the mulberry silks, the fibres seem structureless, having the appearance of a glass rod, and, like glass, having a more or less conchoidal fracture when broken. Wild silks differ from this in structure very much. In almost all of them, each fibre seems to consist of minute fibrils, and under the microscope appear numbers of thin, longitudinal striations throughout the length of the fibre. In the case of Tussur silk, I have been able to separate these fibrils. I ought here to mention two properties of silk which have to do somewhat with structure and practical manipulations. First, silk is more or less affected by water, and always holds it in what Dr. Bowman calls a state of water of hydration, containing more in damp weather and less in dry weather. At the Lyons conditioning-house, silks sent to be conditioned are made absolutely dry at a high temperature in suitably constructed vessels. They are then weighed, and 11 per cent. is added to the dried weight for water of hydration or natural moisture. During the last twenty years, I have made an enormous number of trials of this hygrometric property of silk, and I have found that when silk, having been divested of its natural gum, and dried at a temperature not exceeding 150 degrees Fahr., is exposed to the air, it gains in weight from 5 to 10 drams per boiled-off-silk-lb., or from 2 to 4 per cent. This shows also that a much higher temperature is required to drive off all the water of hydration. Second, the electric properties of silk are remarkable. Silk is a most perfect non-conductor of electricity when dry, and it is amusing to see how loose dry silk fibres start up in *cheveux de frise* fashion when excited by friction. This property seriously interferes with the manipulation of silk in various stages of its manufacture when it becomes too dry. In some manipulations it has to be kept moist by artificially applied means, such as glycerine, &c. It will be seen from this how much more suitable our colder and moister English climate is for silk manufacture than hotter and drier ones. With regard to the chemical composition of silk, there is a little perplexity. Probably the most satisfactory examination yet made, is the following by Mr. Schorlemmer:—"When raw silk is heated in water under pressure, it yields two compounds. Fibrin,  $C_{12}H_{23}N_5O_6$ , constitutes about 66 per cent. of raw silk; it is a silky, glistening substance, which is insoluble in water, but dissolves in strong acids, alkalies, and a solution of cuprammonium sulphate. When boiled with dilute sulphuric acid, it yields glycocoll, leucine, and tyrosine. Sericin, or silk-gelatin,  $C_{12}H_{23}N_5O_6$ , is a substance resembling gelatin. Its hot aqueous solution is precipitated by alcohol, and after drying, the precipitate forms a colourless powder, which in cold water swells up to a gelatinous mass. On boiling it with dilute sulphuric acid, it yields a small quantity of leucine, and larger quantities of tyrosine and serine, or amidoglyceric acid." Dr. Bowman, in his most excellent lectures on wool fibre, gives some interesting facts, in his third paper on wool fibre, from which I will quote, and it will be interesting also to give the composition of cotton and wool fibres for comparison. Perfectly pure cotton is identical with pure cellulose, which is represented by the formula given in the following table, where the formula for silk is contrasted with those for wool and cotton:—

Cotton . . . . .	$C_6H_{10}O_5$
Silk . . . . .	$C_{24}H_{38}N_5O_6$
Wool . . . . .	$C_{48}H_{75}SO_{10}$

The important additional element of nitrogen in silk and wool will be observed, as well as wool standing alone in containing sulphur. I hardly think that this is the right way of stating the formulae for silk. I am inclined to doubt their accuracy, for it is not quite clear that silk is purely an organic substance. If pure silk is fibrin, its formula would be as stated by Mr. Schorlemmer,  $C_{12}H_{23}N_5O_6$ ; but if the composition to be described is that of the fibrin, sericin, albumen, and gelatin contained in silk as it exudes from the silkworm, it can hardly be formulated as a distinct chemical compound. I may here state, in passing, that Dr. Wanklyn's admirable ammonia process for estimating the amount of organic matter in water, is applicable for determining the exact amount of silk when in combination with weighting matter. I am at present at work on this, and as soon as the results are worked out, I intend that they shall form the substance of another paper in connection with details concerning the *modus operandi* of silk

weighting, now so very largely practised on the Continent of Europe, and to a certain but more limited extent, I am sorry to say, in England, where in recent degenerate days foreign competition in price has rendered it more or less imperative. It will be of the highest importance to describe a method by which chemists can at once, with certainty, determine the exact amount of sophistication in any so-called silk fabric.

(To be continued).

### Commercial Failures.

According to *Kemp's Mercantile Gazette*, the number of Failures in England and Wales gazetted during the five weeks ending Saturday, August 29th, was 421. The number in the corresponding five weeks of last year was 328, showing an increase of 93, being a net increase, in 1885, to date, of 449. The number of Bills of Sale published in England and Wales for the five weeks ending Saturday, August 29th, was 1,154. The number in the corresponding five weeks of last year was 1,026, showing an increase of 128, being a net increase, in 1885, to date, of 542. The number published in Ireland for the same five weeks was 81. The number in the corresponding five weeks of last year was 60, showing an increase of 21, being a net increase, in 1885, to date, of 14.

### The Commission on Depression of Trade.

The *Gazette*, September 2nd, contained, under date Whitehall, August 31st, a notification of the formal appointment of the members of the Royal Commission on Depression of Trade. The commissioners nominated are as follows:—The Earl of Idlesleigh, the Earl of Dunraven and Mount-Earl, Mr. George Selater-Booth, M.P., Sir Joseph Allport, Mr. John Aird, Mr. Thomas Birtwhistle, Mr. Lionel Louis Cohen, Mr. James Porter Corry, M.P., Mr. David Dale, Mr. Charles James Drummond, Mr. William Farrer Ecroyd, M.P., Mr. Henry Hucks Gibbs, Mr. William Henry Houldsworth, M.P., Mr. William Lawies Jackson, M.P., Mr. George Auldjo Jamieson, Mr. Neville Lubbock, Mr. Philip Albert Muntz, M.P., Mr. Arthur O'Connor, M.P., Mr. Robert Harry Inglis Palgrave, Mr. Charles Mark Palmer, M.P., Mr. William Pearce, Mr. Bonamy Price, and Mr. Samuel Storey, M.P. The notification states that the Commission has been issued to inquire and report upon the extent, nature, and probable causes of the depression now or recently prevailing in various branches of trade and industry, and whether it can be alleviated by legislative or other measures, and after appointing in due form the members of the Commission, the document proceeds as follows:—"And for the better effecting the purposes of this our Commission, we do by these presents give and grant unto you, or any six or more of you, full power to call before you such persons as you shall judge likely to afford you any information upon the subject of this our Commission; and also to call for, have access to, and examine all such books, documents, registers, and records as may afford you the fullest information on the subject, and to inquire of, and concerning, the premises by all other lawful ways and means whatsoever. And we do further, by these presents, authorize and empower you, or any six or more of you, to visit and personally inspect such places in our United Kingdom as you may deem expedient for the more effectual carrying out of the purposes aforesaid. And we do by these presents will and ordain that this our Commission shall continue in full force and virtue, and that you, our said Commissioners, or any six or more of you, may from time to time proceed in the execution thereof, and of every matter and thing therein contained, although the same be not continued from time to time by the adjournment. And we do further ordain that you, or any six or more of you, have liberty to report your proceedings under this our Commission from time to time, if you shall judge it expedient to do so. And our further will and pleasure is, that you do, with as little delay as possible, report to us, under your hands and seals, or under the hands and seals of any six or more of you, your opinion upon the several matters herein submitted for your consideration. And, for the purpose of aiding you in such matters, we hereby appoint our trusty and well-beloved George Herbert Murray, Esq., to be secretary to this our Commission."



**FRICITIONAL ELECTRICITY.**—Electricity is frequently caused by the friction of belts on pulleys, a fact known in Germany for a long time, but first described in our country, I believe, by Mr. F. W. Whiting. This has been the cause of fires, and should be guarded against by connecting all parts on which the electricity accumulates with the ground by means of wires attached to the object and to a gas, or preferably, a water-pipe. This is one of the most prolific sources of fires in the best of coating works, and in oil-cloth factories, as the electric sparks readily ignite the benzine vapours present.

(Continued from Page 15)

**I** COME now to a short consideration of spider-silk. As so well known, spiders are great producers of this fibre, both for their webs and nests. As the examination of spider-silk is comparatively new to me, I have not had time to make a very minute investigation of it, but it will form the basis of a future interesting work. Professor Thielston Dyer, some time ago, was good enough to ask me to investigate some spider silk which a correspondent, Mr. Duthie, had sent to him from India, and in describing this, I think I cannot do better than read first the letter which Professor Dyer received from Mr. Duthie. The letter is dated, "Botanical Gardens, Saharanpur, November 25, 1884," and is as follows:—"By to-day's mail I am sending you some queer-looking stuff—spider-silk. It was extremely lovely as I saw it when coming down from Almora the other day. Enormous webs of stretched between the trees and shrubs overhanging the lake at Bhim Tal in Kuman. I saw a notice a short time ago, in some paper, regarding the use which might be made of these string-webs. A particular kind, of a golden yellow colour, occurring in New Zealand, was specially recommended, and in fact it had been manipulated with success as a substitute for silk. What I saw at Bhim Tal answers very much to the description of the New Zealand kind, and if a supply is wanted for an experiment on a large scale, it could easily be obtained from this locality after the rainy season is over. In a small tin box enclosed in the packet, I am now sending, are a few of the spiders, not in very good order, but I had to send for them." Professor Dyer called in the learned aid of the Rev. O. P. Cambridge of Bloxworth Rectory, Wareham, relative to the natural history part of the subject, and, as his letter is very interesting, I do not think it will be considered out of place here. He says:—"The spiders are broken, shrivelled, and crushed out of all recognition almost. The genus, however, is clear enough, and I have no hesitation in pronouncing them to be (an *Epeirid*) *Nephilengys malabarensis*, Walck. Walkenaer described it as an *Epeira*. I described it also some years ago from the China Sea and the Congo, and other parts of the West African coast (supposing it to be new), as *Nephila rivulata*. Subsequently L. Koch separated it from *Nephila*, under its present (good) generic name *Nephilengys*. It seems to be almost cosmopolitan; it has been described under another name, from Amboina, by Doleschall, and under another, again, by L. Koch, as well as twice, under different names, by Walkenaer. I have it from China seas and India, as well as from Australia, Borneo, and West Africa, and I think, (though I cannot at this moment refer to my collection and books) from other regions as well. It appears to be exceedingly abundant in all its localities. The silk (which is new to me) is very strong and tough, and I should imagine that the fabric which might be made from it would be almost imperishable. Whether it could be spun out from silk collected *en masse* from the spiders' snares, I should doubt. I fancy the only way to get the silk in condition for spinning and weaving, would be after the method as Dr. B. G. Wilder proposed, and experimented in (and I believe, successfully, some years ago, in North America). But the great drawback will always remain, that spiders die at each other, and so cannot be fed, or their silk obtained without great trouble and cost." After carefully examining this spider-silk, I made the following report:—"The fibre is evidently of a silken nature, and, like silk, it is loaded with a gummy substance. In a boiling soap solution this gum, or varnish, dissolves, leaving the fibre apparently pure, and of the nature of fibrin, if not identical with it. Eight micrometric measurements of the diameter of the fibre in different parts of the mass showed great irregularity in diameter (平均 0.00015 至 0.00025 吋), giving an average of  $\frac{1}{1600}$  inch. It is therefore, a considerably finer fibre than brin than silk, the brin of Italian silk being not finer than  $\frac{1}{1000}$  inch. The average strength of the spider-silk is proportionately greater than that of silk, a single fibre of the spider-silk breaking with an average weight of  $\frac{1}{24}$  drams avoirdupois, whilst that of China silk, so much thicker, breaks at 2 to 3 drams. The most curious property of this fibre is its elasticity, which is considerably greater than that of silk; 30 centimetres of it will stretch to an average length of 36.6 centimetres before breaking, whilst China silk will only stretch to 34 or 35 centimetres. Like silk, this spiders' web-silk is lustrous, and has a round fibre. Its coating of gum or varnish is disproportionate to the weight of the silk. On boiling with soap it lost weight at the rate of  $\frac{7}{8}$  ozs. per lb. avoirdupois, that is, 1 lb. of the spider-silk discharged  $\frac{7}{8}$  ozs. of gum. In the silk of the *Bombix mori* worm the proportion is much less, the gum seldom being over 25 to 30 per cent. of the total weight. Before boiling in soap, the spider-silk was well combed to remove all the dirt possible, but a little remained. The fibre appears to receive tinctorial matter readily. I enclose a small pattern of it dyed, and also one as I received it, and one after boiling in soap. I believe, if it can be obtained in quantity, it might be packed in bales and sent to England, where it would readily find a market for being carded and spun into spun silk threads for sewing or weaving purposes. It is difficult to estimate its marketable value. I dare say it would at any rate realize rs. to 2s. per lb. It is rather dirty, and this would, to some extent, detract from its value as compared with silk waste. I have tried to discover how many seripositors this spider has, but beyond noticing, under the microscope, that the fibres often run in pairs, but not regularly, I am unable to trace whether there are two as in the ordinary silkworms, or more. Probably an examination of the spider would

\* From a paper read before the Society of Arts, by Mr. Thomas Wardle, F.C.S., F.G.S.



THE JOURNAL OF FABRICS AND TEXTILE INDUSTRIES.

10th SEPTEMBER, 1905.

DESIGNED BY R. T. LORD.



MADRAS MUSLIN.





## ORIGINAL DESIGNS.

Our first plate contains a design for a Madras Muslin Curtain. The colours proposed to be used are Cream-white for the ornamentation, shaded with a Pale Sage Green, and the flower should be planted in Pale Blue and Terra Cotta. We beg to commend the same pattern to the notice of linen and cotton manufacturers. The design is the work of Mr. R. T. Lord, 97, Park Road, Bradford.

On our second plate we give a design for Leno or Gauze Fabrics, particulars of which are given on page 31.

On our third plate is a design for Silk Dress Goods, also the work of Mr. R. T. Lord.

### TO MANUFACTURERS AND DESIGNERS OF CLOTH.

The latest patterns of French and English Coatings, Vestings, Suitings, Fancy Cloths, Cassimeres, Tweeds, Mantle Cloths, &c. These Patterns give the latest Designs and Colourings for Cloths.

### 100 SAMPLES FOR £2. CARRIAGE PAID.

A remittance must accompany order, made payable to H. and R. T. Lord, the "Journal of Fabrics and Textile Industries." Office, 10, Ann Place, Bradford, England.



**Wool.**—Quietness has characterised the English wool markets in nearly all departments; there may have been an improved feeling towards the latter part of the month, but this has not materially improved prices, which have receded slightly. In Botany descriptions, a little inquiry has been made, although buying has not taken place to any great extent. The yarn trade has fallen off, with the exception of Botany yarns; spinners of these have experienced an improved demand. Prices have fallen slightly. In the piece branch there has been a continued improvement in the demand for America, whilst for other foreign countries, and for the home trade, business has been restricted.

**Cotton.**—There has only been a limited demand for the raw material during the month, and prices have, in consequence, fallen slightly. The daily stoppage of looms has, in a great measure, had to do with this state of things, although the strike at Oldham has materially affected the markets. The yarn trade has been quiet both for home and foreign centres, and the same may be said of the piece branches. What orders there have been from abroad have been offered at such rates as to make it impossible for manufacturers to work remuneratively, and, in consequence, as looms have gone out of work, manufacturers have preferred to let them remain idle, the result is that considerably more looms are now standing than was the case two or three months ago, and the prospect of their being run profitably seems remote, judging by the present out-look.

**Woollen.**—In the Huddersfield and Leeds districts, trade has been fairly good, the demand, as has been the case for some time past, being for a good class of worsteds in fancy designs and colourings, these seem to please the taste of a large number of buyers. In the medium qualities an average business has been

done, and prices have, as a rule, been higher. In woollen, of a medium and low quality, new orders have had to be taken at reduced rates, and this branch of business has assumed a quieter aspect. In the heavy woollen districts, trade has not improved either in demand or prices. In the Scotch districts, a moderate business has passed, but competition has prevented any satisfactory margin for profit.

**Linen.**—There has been no improvement in the linen branch, quietness in all departments being the prevailing feature, and the prospects of an early improvement are not very encouraging. Prices, on the whole, have kept firm, but the new business passing has not been sufficient to make a test of them. The jute branch has not shown much improvement, the demand being very restricted, and prices having a falling tendency.

**Lace.**—In no branch of the lace trade has there been any material change for the better, although there has not been any further depression. In no department has activity shown itself. Almost all classes of goods are to be had in abundance at very low prices. The curtain branch is still quiet, although there is an improvement upon a few months ago. The prospect for the future does not look particularly bright.

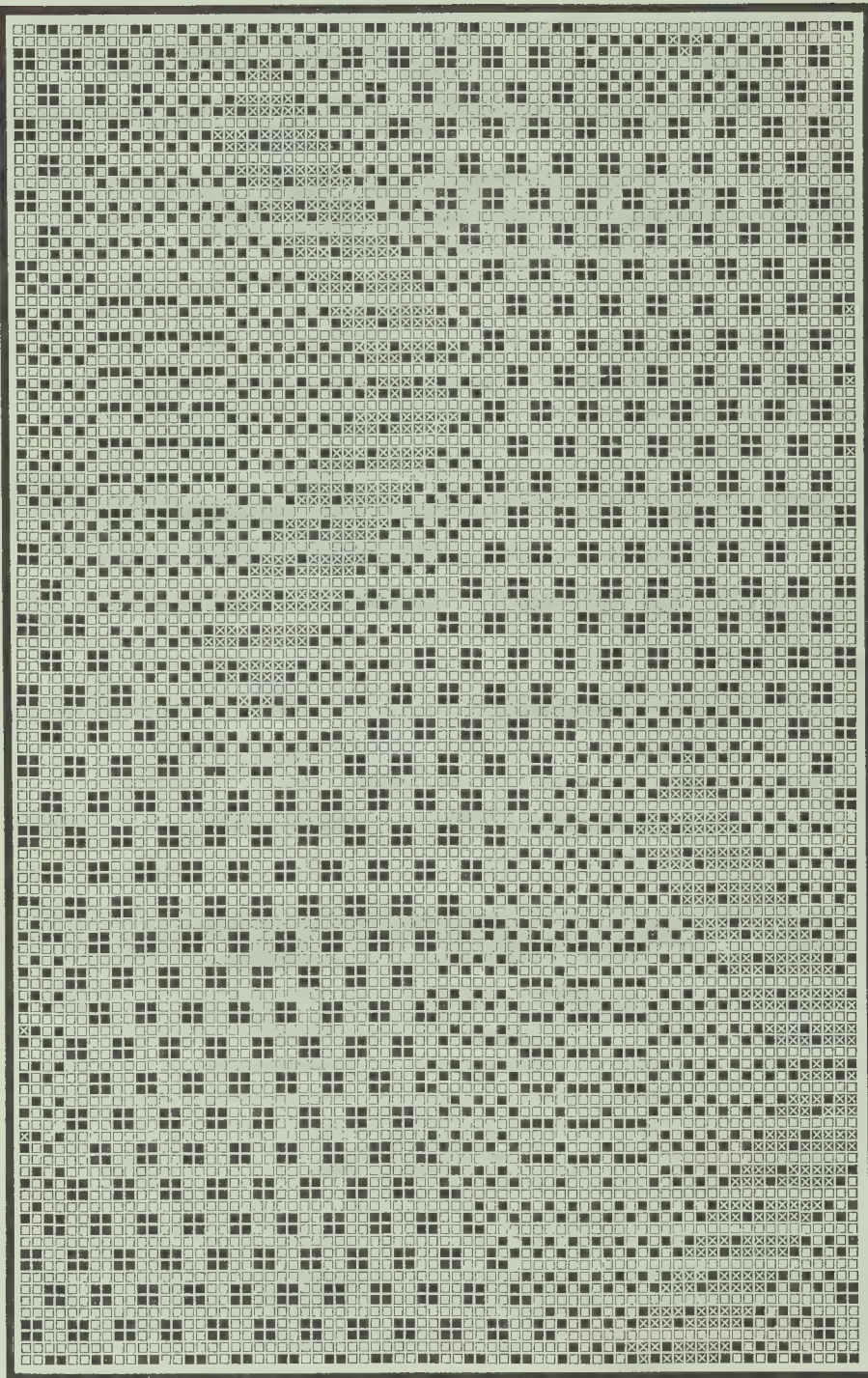
### A New Method of Preparing Indigo.

Indigo carmine plays an important part in wool washing, in spite of the many blue artificial derivatives of coal tar. It works easier and more uniform on the fibre than the artificial blue colours, and combines better with wood colours. It is obtained by dissolving finely powdered indigo in sulphuric acid. In order to produce this liquid, also known under the name of indigo composition, it is recommended that indigo as pure as possible be selected, the product from Bengal and Japan being the best. Indigo may be purified by washing in diluted and boiling sulphuric acid. One part indigo and five parts sulphuric acid of 66° Bé are united in a leaden vessel. The indigo must be finely ground, sifted and dried well. The vessel in which the mixing takes place should be kept cool, and the indigo added in small portions by degrees, constantly stirring. Heating should be avoided by all means, as it would result in the liberation of sulphurous acid, which would injure the good qualities of the finished product. The old method by which the indigo solutions are produced with the application of heat, furnishes a greenish blue, but these prepared by the cold process yield purer blues, and about five per cent. more of it. Before commencing on the second manipulation, the indigo solution should be left standing for several days in closed vessels in order to avoid attraction of moisture from the air. Some indigo purple is formed at first, but this gradually disappears. The preparation of the indigo carmine is directed principally to the removing of the excess of acid and the impurities from the solution, which give to the product the greenish appearance. The remaining product is indigo sulphate of soda. The object is accomplished by a series of manipulations, as dissolving, filtering, precipitating, pressing and neutralizing, all of which cost much time and money. The cost of manufacturing indigo carmine, by the usual process, is about 15 per cent. on the price of the indigo composition. I have succeeded in finding a method of preparing indigo carmine, which costs only 2 per cent. of the price of the indigo composition, and by which everybody is enabled to prepare carmine without the extensive apparatus heretofore necessary for the manufacture. It is sufficient to prepare dry plates of plaster of paris 3 to 4 inches thick, which need drying before each operation, upon which the indigo composition is poured, one part composition to one part plaster of paris. The sulphuric acid is attracted by the porosity of the plaster of paris, by which, also, the impurities are removed. The effect is very rapid. After 12 hours the gypsum plate has turned a greenish blue; it has absorbed all the sulphuric acid, and the whole amount of concentrated sulfdigotenic acid remains on the plate in form of a thick plate, as thick as if taken from the press. This product can at once be used for dyeing or for preparing a pure and concentrated solution. This quick and cheap method of manufacturing indigo carmine is so easy that everybody can try it. It is sufficient to prepare gypsum plate, which can be thrown away after using without great loss, as the material is very cheap.—*M. Moyet in Textile Monitor.*

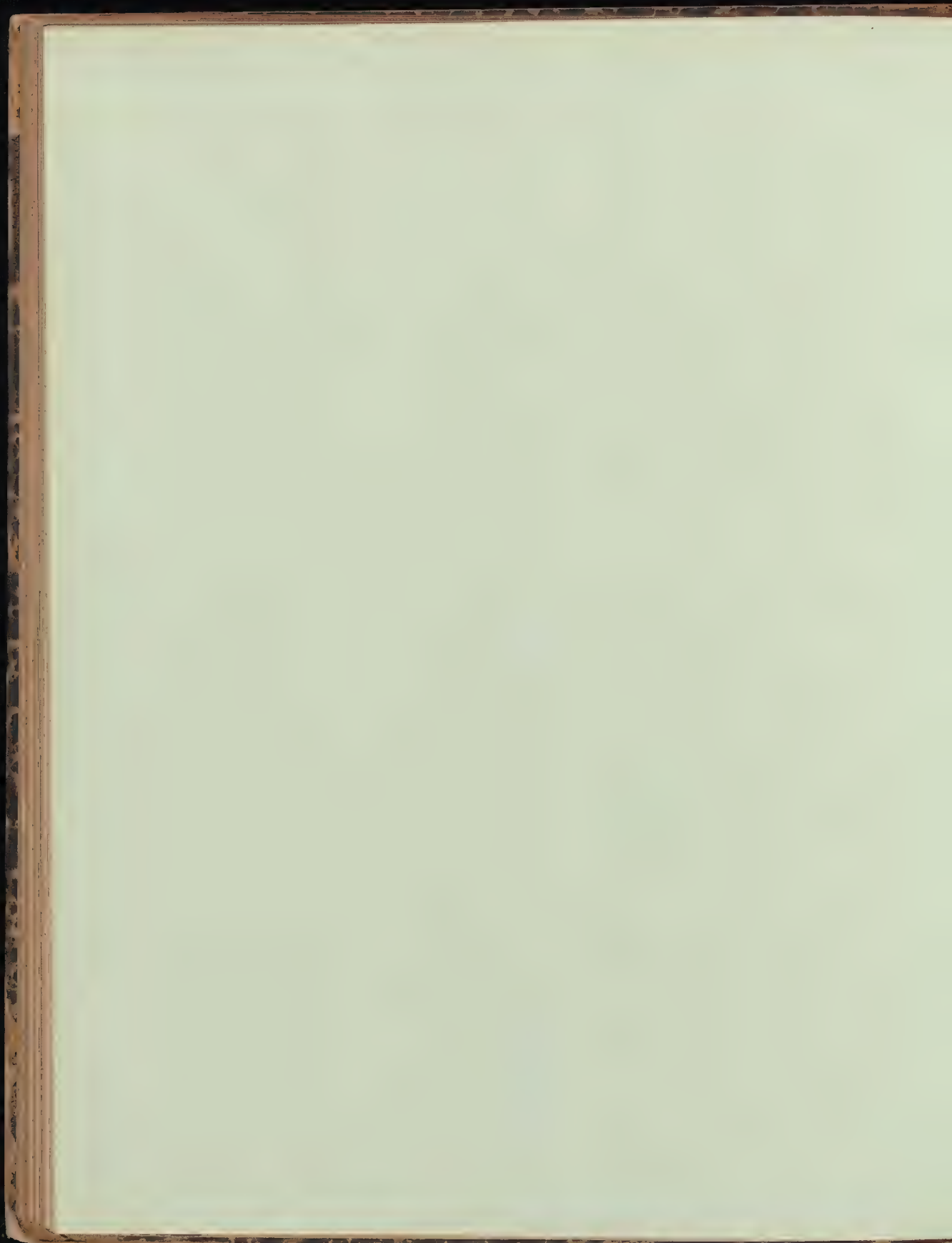


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12TH SEPTEMBER, 1895.



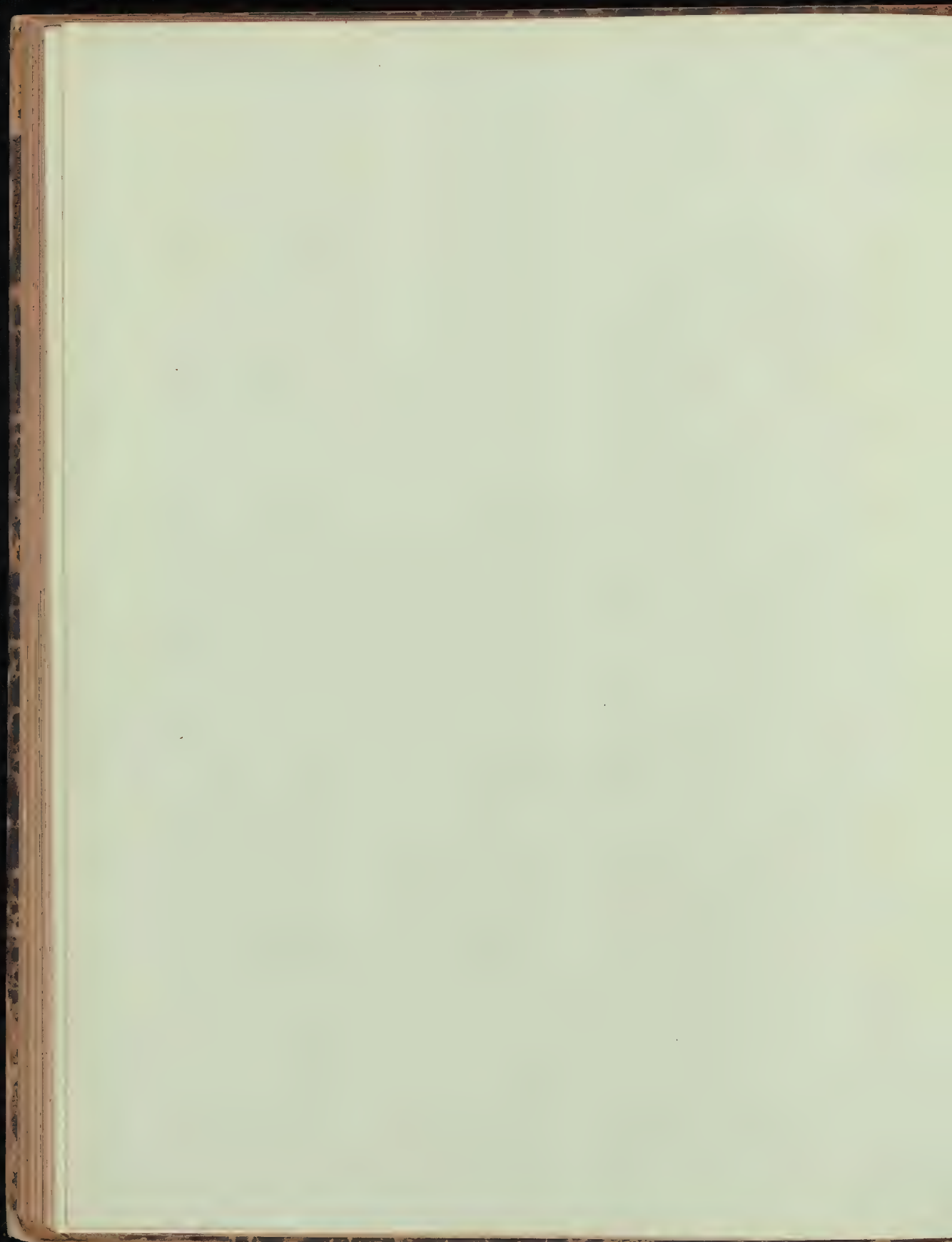
DESIGN FOR LENO.







SILK DRESS GOODS.



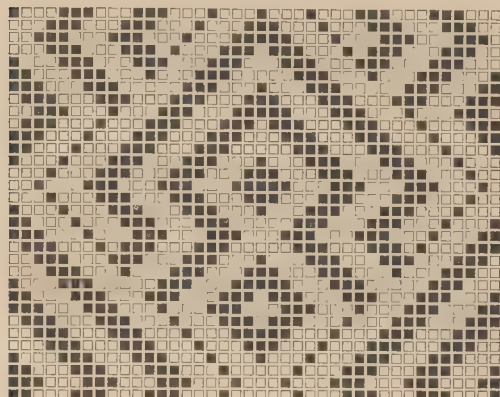




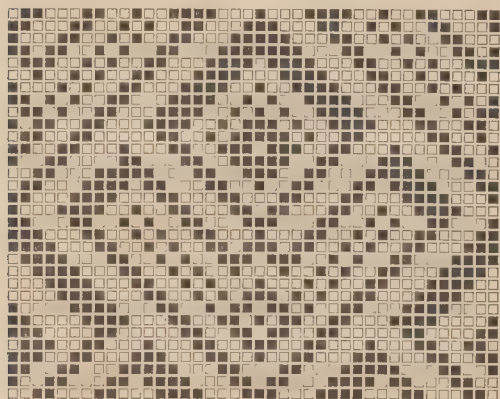
Designs for Stuff Dress Goods.

The following designs are neat and effective figures for Dress Goods. The particulars are as follows: Sett, 60's; warp, two-fold 40's; weft, 80's. 15 picks per inch.

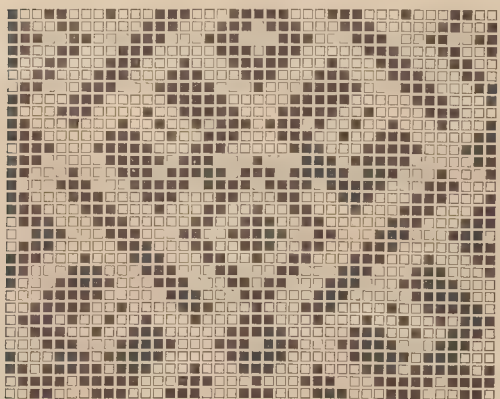
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No. 302.



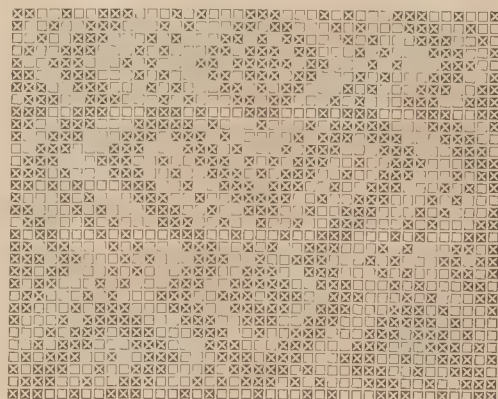
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No. 304.



No. 305.



Design for Leno or Gauze Fabric.

We give a design (No. 306) for Leno or Gauze Fabric which will be found on our second separate plate. The particulars are as follows:—Canvas leno ground, and plain and weft figure suitable for a 20's sett, 5 picks, 2/16's warp, 10's weft, cut ■ and □. We shall be pleased to forward to any of our subscribers, a sample pattern woven from this design by the aid of M. Priestley and Co.'s Improved Harness, to which reference is made on page 19 in our August number.

## MACHINERY, TOOLS, &C.

### Machine for Planing Wood.

We called the other day at the works of Messrs. John Sutcliffe and Son, Jail Lane, Halifax, to see a machine for planing either hard or soft wood out of twist and for thickening combined. We saw them plane about one dozen hard pieces ( $2\frac{1}{2}$  in. thick,  $5\frac{1}{2}$  in. wide, 32 in. long) for gripping silk, all the twist being out over the top tables, perfectly true; then they were put under the feed rollers and all planed to one thickness exactly; this was accomplished in a far superior manner than if done by hand, and was completed in thirty-five minutes. Upon further enquiry we found that to have finished the same by hand would have occupied one man nearly a whole day. This work was done without stopping the machine or altering anything whatever, only winding up the bottom table. They planed for us a bit of thin wood, (pitch-pine) only  $\frac{1}{2}$  of an inch in thickness, in such a manner as to prove satisfactorily to us that they had a very sensitive and effective way of holding the wood down while being operated upon. Another good point that we noticed was the three knives fixed on a triangular-shaped steel spindle, that were made at twist, and gave a shearing cut, which is considerably better than any spindle that only carries two knives, as the angle of knives when cutting is in a better position than a square block, and we have seen a spindle with three knives on, not at twist, turn out far nicer work than one with only two knives on, that were at twist; therefore it clearly shows that the one with three knives on must have the preference, and especially when fixed at twist. When the knives are off they are perfectly straight, and can, when dull, be ground on an ordinary grindstone, but, of course, they would be done much quicker and straighter on one of their automatic knife grinding machines. We are confident that the above machine would be a great saving to manufacturers, especially to those who employ more than three joiners, as it will do more work and better than six men. The machine takes very little room; one to plane twenty inches wide stands in 4 ft. 6 in. square, and does not require bolting down; it simply needs a belt putting on to drive it at 3,000 revolutions per minute. It is very substantially and mechanically made; the shafts for driving the gearing, for feed rollers, for thickening wood, are spread from one side of the machine to the other, so that the bearings are a long way apart, which insures steadiness and durability, and when planing out of twist over top of cutter block, all the wheels for feeding are at a stand, which is done by simply moving a belt tightener; this stops them instantly without stopping the cutter block, and as there is a cover over the gear wheels, it answers as a good support for the workman's body to lean against, so that he does not feel tired with having his back bent in one position when he has much work to do of that class. We are further informed that Messrs. Sutcliffe and Son were the first to introduce this style of machine for doing the above classes of work combined in one machine, and always ready for either operation without any altering. (The Americans introduced one previously, but it required from ten to fifteen minutes altering in order to fit it for doing one class of work, and the same time to alter back again, which was a loss of time.) The price was considerably higher than the one Messrs. Sutcliffe make. There are several firms in and about Halifax that have had these machines working nearly five years, and so far they have not cost anything in repairs, and all give good satisfaction. We are informed that they have lately supplied Messrs. Clayton, Marsdens and Co., silk spinners, Lower Wade Street, Halifax, with the above class of machine. Therefore, we think, we can safely call the attention of our manufacturing readers to them. Before sending out, the machines are properly tested by the most experienced workmen, and also guaranteed by the makers for six months. Intending purchasers would do well to write and ask for reference to firms that have them working, or, better still, to call at the works, Jail Lane, Halifax, and inspect the machines whilst in operation.

### A Novelty in Safes.

Mr. William Corless, the well-known maker of steam engines, has invented a spherical safe, the novelty of the construction of which is that it has no door. From "Iron" we take the following description:—"The new safe is very different in construction from other safes, consisting of two spheres, one within the other. The inner sphere revolves within the outer, which is simply a massive protecting case. As the outer shell is only two-thirds of a complete sphere, a considerable opening is left in front, and into this is fitted from the inside a part of the smaller sphere, which is the safe proper. The inner sphere revolves upon two pintles. It can also be moved backwards and forwards, so that its outside diameter corresponds exactly to the inside diameter of the outer shell, the joint being formed by a series of steps, and when brought forwards it is said to make a very tight fit. The safe is of solid metal throughout, having only one thickness of material, and the shell consists of but three pieces, the back and front, composing the outside, and a piece comprising the principal part of the inner sphere. The outside is made in two parts, so that the safe proper, which is larger than the opening, can be placed within it. The parts are screwed together, after the manner of a hose coupling, and locked in position by bolts from the inside. The thread, of course, is the entire circumference of the shell, and is probably the largest ever cut. The jointing surfaces, at and near the outside, are too hard to be cut by a steel tool, and are ground so accurately that there is absolutely no space between them. The safe section is one piece of metal  $\frac{1}{4}$  in. to  $\frac{1}{2}$  in. thick, slightly flattened at the front. The inventor claims that the safes are burglar-proof, for the reason that they cannot be forced and robbed of their contents in the space of time that burglars are supposed to have, and by use of implements possible for them to employ.

### On Yarn and its Inequalities.

BY J. C. GOODFELLOW, HAWICK.



THE size of the threads or ends, used as warp and weft, is differently expressed in different localities. By "size" of thread is meant, of course, the circumference or the diameter of the thread. A "thread," it may also be observed, is the length in inches round a reel, or machine, for making yarn into wraps or cuts. There are several sizes of reels—54 inch, 72 inch, and 90 inch reels, are, however, the most common sizes in use. In Huddersfield, and in several other places in Yorkshire, the most common reel is 54 inches in circumference, and the Huddersfield yarn measure may be thus tabulated:—

54 inches	1 thread =	54 inches or =	1½ yards.
80 threads	1 wrap =	4320 " or =	120 "
7 wraps	1 hank =	30240 " or =	840 "
4 hanks	1 bunch =	120960 " or =	3360 "

In the woollen manufacturing districts of Scotland, the reel most commonly in use is the 72 inch reel,—the 90 inch reel being chiefly used in the linen manufacture. The Scotch woollen yarn measure may be thus tabulated:—

72 inches	1 thread =	72 inches or =	2 yards.
150 threads	1 cut =	10800 " or =	300 "
12 cuts	1 slip =	129600 " or =	3600 "
4 slips	1 spindle =	518400 " or =	14400 "

The basis of the size of the different counts, or Grists, differs in the various localities. Thus in the woollen manufacturing districts of Scotland, size is spoken of as *Grist*, and the difference in size is spoken of as *Cut*. When we wish to know the size of yarn, we ask "What is the Grist?" and the answer to that is, so many Cuts. The base, or ground, on which the cut is determined, is the number of times that there are cuts in a certain weight, each cut consisting of 150 threads of 72 inches in length, or of 120 threads of 90 inches in length. The standard of weight to length is in Hawick 24 oz. avoirdupois, in Galashiels it is 26 oz. avoirdupois. It is thus seen that the principle on which size, whether stated as cut, skein, hank, or bunch is calculated, is so much length to so much weight. If the yarn is fine, that is, with a small diameter, then it is much longer in length than when the diameter is larger, or in other words, when it is a coarse yarn. It often happens, however, that yarn varies in weight, and when it does so, the tendency is for it to become coarser or heavier than it is wanted to be. This is owing to many causes. The chief cause is the drying of the material between the time when it is prepared for willowing or teasing, and the spinning it into cops or broughs. In some factories a solution of soap and water is mixed with the oil which is put on the wool before carding; the water has a great tendency to evaporate, and if the lot or batch be a large one, this often makes a considerable difference in the quantity of wool spread on the feeding-in board of the carding machine. I have known as great a difference as ten per cent. ascribable to this cause alone—that is, I have known yarn, that ought to have been spun to 40 skeins, be spun to 36 skeins only. The spinner, when he started the batch, would set the jenny to spin at 40 skeins, but as the sliver on the spools became thicker, the spun yarn also became heavier or coarser, or of a less count or grist than before. In order to prevent this variation in the count, the spinner ought to test the size every time he strips the jenny, and alter the gauge pinions accordingly. There is not so much difference now, however, in the variation of yarns as there used to be a number of years ago. Unequal yarns produce in cloth striping lengthways, and shading breadthways, and these defects in finished cloths have almost always led to the rejection of the goods. In some classes of goods, defects of this kind are more easily seen than in others. Goods which are made of self, or solid colours in warp and weft, more especially if there is a considerable difference in the shade or colour of the warp and weft, always show defects much more readily than others. Thus a dark warp and a light weft, or a light warp and a dark weft, will show striping and shading, owing to the contrast, when other goods made of the same yarns but of a different pattern will not. In order then to get as perfect and equal yarns as possible, the constant supervision of efficient and experienced foremen is necessary. The initial processes of mixing and carding the lots



must be carefully looked after, and every striping taken off the mule ought to be tested, in order that it may be known whether, or not, there has any difference taken place in the weight of a specified length. In very many factories, the utmost care and attention is paid to every step in the process of yarn manufacture. The art of making perfect woollen cloths depends in a very great measure on having equal yarns, which are suitable for any class of pattern. The quantity of goods returned yearly to manufacturers is a proof that there is a great deal yet to be done before the making of perfect cloth can be assured.

### Ornamentation of Textiles.

(Continued from Page 5).



THESE evangelists embellished their manuscripts and jewellery with all kinds of devices; and when we examine them we are astonished at their remarkable and extreme richness, and the ingenuity that has been displayed in arranging the figures of the design. Letters and fine arts began to revive in the west, about the eighth century, mainly through the enterprising and enlightened spirit of the English and Irish missionaries, and under the fostering care of the Emperor Charlemagne, who established public schools in different parts of the empire, and gave his royal encouragement to all the arts, sciences, and literature of his time. He sent to other countries, where the sciences and handicrafts had not been so thoroughly extinguished, for teachers and professors to train his own people, and it was thus that English artistic works acquired a wide repute on the mainland. Saint Bernard (Abbot of Clairvaux), who lived in the twelfth century, was one of the greatest patrons of the arts and sciences of his day, and he was himself highly skilled in nearly all the formative arts, and is also credited with having devoted careful study to the manufacture of Irish vases, and to the works of the English goldsmiths, that found their way into the imperial courts. Very soon after the Conquest, the productions of the English looms were called into demand, and consequently the textile manufacturer became very busy. English weavers, at this remote period, had made considerable advancement, and were not behind-hand in their embellishments and designs; the specimens of early English workmanship, which are to be seen in our public museums, bear testimony, and are proofs that we have, from a very early date, made garments, hangings, and tapestries, and ornamented them with exquisite and ingenious designs; and the work and skill of the artificer were admired and prized by the nobility and peasant alike. We read that on great state occasions in England, ornamental fabrics and tapestries were requisite for the adornment of the streets and palaces. Such fabrics have, from the remotest ages, been valued far and near; when any one possessed these textiles they preserved them with solemn care, and when the owner of them was preparing to leave this life, he would, on making his bequests, insert in his will to whom his favourite tapestries and clothing were to be given. Richard, Earl of Arundel, in 1392, willed "to his dear wife, the hangings of the hall, which were made in London, of blue tapestry with red roses, and with the arms of my sons." The Lady of Bergavenny, after bequeathing her hulling of black, red, and green, to one friend, left to another her best stained "hall." Matthew of Westminster, complaining of the ruin of our export trade in woollen goods in his time, assures us that with these goods England had formerly supplied the whole world; this latter statement should be accepted as a little exaggerated, for we must not take all the credit to ourselves for the advancement of the textile industries. No doubt, the woollen goods of Flanders would be sold wherever the sea or river would permit them to be conveyed; about 1380, Flanders was an open market for the traders of the whole world, and it is stated that merchants from seventeen kingdoms had their places of business in Bruges, besides the strangers who repaired thither from almost unknown countries; and this may be one reason why the Flemish weavers came over to England and brought their art of weaving amongst us, or it may have been the fault of the authorities who, levying a tax on the loom, provoked the weavers to leave their native country and take up their abode in England, during the reign of Edward III., who held out to them all manner of inducements to settle in this country. Fuller, writing on the offers held out to them, says:—"Here they should feed on fat beef and mutton, fill nothing but their fulness should stint their stomachs; their beds should be good, and their bed-fellows better, seeing that the richest yeomen in England would not disdain to marry their daughters unto them, and such were the English beauties that the most envious foreigners could not but commend them." The occupation of woollen weavers, manufacturers or merchants, became honourable, and they were placed on the same footing as a landed proprietor. During this epoch, 1,300, Bath, Worcester, Norwich and other places, became famous for their woven productions, such as the commoner sorts of silks, and cloths of wider breadth, specimens of which are to be seen in the Brooke collections; but at an earlier date, the English were noted for their needlework, a great quantity of which was produced in the nunneries; the skilful workmanship and elegance in design of these productions may be judged of from the many specimens now to be seen in South Kensington; the ingenuity of these

ornamental textiles was of wide repute, they were admired at home and abroad, and foreigners especially were fain to be possessed of this beautiful English work. Matilda, wife of William the Conqueror, carried away from the Abbey of Abingdon its richest vestments, and would not be put off with inferior ones. Among the copes reserved for the prelates use in the Chapel of Charles, Duke of Bourgoigne, brother-in-law to John, Duke of Bedford, there was one of English work, very elaborately fraught with many figures. At home, also, we have abundant proof of the value set upon our own productions, and upon the skill of the English artisan. In the Issue Rolls it is stated that "Henry III. had a chasuble embroidered by Mabilla, of Bury St. Edmunds," and that Edward II. "paid a hundred marks to Rose, the wife of John de Bureford, a citizen and mercer in London, for a choir cope of English embroidery, and which was to be sent to the Pope as an offering from the Queen." There are very few people of the present day that have the faintest idea of the patience, skill, money, ingenuity and length of time, that must have been bestowed upon these ancient pieces of ornamental fabrics. We have considerable testimony and sufficient contemporary evidence to shew that this extraordinary craving for gorgeous fabrics, and that the ability and skill to produce them, were not limited to these islands, but that other nations had their highly artistic and clever workmen; thus we read that "at San Giovanni in Florence, there were made certain rich vestments (after the design of the works of Antonio Pollenolo, who died 1,498), all of gold wove velvet, with pile upon pile, each woven of one entire piece and without seam, embroidered with the most subtle mastery of that art, by Paola da Verona, a man most eminent in his calling, and of incomparable ingenuity, and that this said vestment took twenty-six years for its completion." There are many other textiles which it is not our intention to dwell upon, but in passing we may say that the word textile includes all kinds of stuffs, no matter what its material, that fabrics are made from, whether from the animal, vegetable or the mineral kingdoms:—Wool, hair, flax, hemp, fibrous filaments drawn from plants and flowers, and the coatings of pods—such as cotton—gold, silver, and last, not least, paper, a material used in other countries, and from which garments are made. Shoes and gloves we beg to pass over with few remarks, but nevertheless they have not played a trivial part in the ornamentation of days gone by. We learn from the York wills, that ceremonial shoes, worn by bishops, were a part of the episcopal attire. These were made of velvet, or damask, or strong linen embroidered. Among the new year's presents to Queen Mary was a pair of gloves embroidered with gold. Shakespeare, after making *Antiochus* chant the praises of

"Lawn as white as driven snow,  
Cyprus black as ere was crow,  
Gloves as sweet as damask rose."

puts the following into the mouth of the *Shepherdess*,

"Come, you promised me a tawdry lace and a pair of sweet gloves."

Quilts have also had a conspicuous part to play in adorning the habitations of our forefathers, and some of them were highly prized; we all know how our ancestors collected and preserved small remnants of fabrics and made beautiful patch work quilts, and these they have handed down from generation to generation. On some of these coverings, at each corner, are figures representing the four evangelists, reminding us of the old nursery rhyme,

"Matthew, Mark, Luke, and John,  
Bless the bed that I lie on."

Robes for baptism were looked upon as sacred garments, and were ornamented in the most sumptuous fashion. Shakespeare mentions them in the *Winter's Tale*,

"Here's a sight for thee, look thee, a bearing cloth for a squire's child."

(To be continued.)

### The Belfast Technical School.

We learn from the *Belfast Northern Whig* that the Belfast Technical School is making rapid strides in the work undertaken and is surpassing the most sanguine expectations of its promoters. Sixty-three students attended the last session, but now that the promoters intend to add "linen manufacture" to the subjects already undertaken, the number of pupils should be greatly increased during the session, which commenced Sep. 7th. The result of the spring examination in "weaving and pattern designing," as taught in this school, was very satisfactory, considering the short time the pupils had been at the school. The City and Guilds of London Institute have recently issued their pass list, from which it appeared that thirteen students out of twenty-three who went in for the examination were successful, six gaining first-class and seven second class certificates, one student obtaining a bronze medal. In the current session, "besides weaving and pattern designing," instructions will be given on the subject of "linen manufacture" as laid down in the City Guilds syllabus, which embraces the growth and treatment of the flax plant, the preparing and spinning processes, as well as instruction regarding hand and power loom weaving of linen and union fabrics.

## Friction of Leather Belts on Iron Pulleys.

From "The Journal of the Franklin Institute," by SILAS W. HOLMAN.



THE present investigation (completed in 1882) was undertaken with a double object: First, to make a somewhat more detailed study of the variation of friction with changes of velocity of slip in a few substances, and to make a further study of the friction of belts of leather and other materials over the surfaces of pulleys. It was also desired to ascertain how far the necessary arrangements would be suitable for an instructive laboratory experiment for students; a problem which has since been brought to a very satisfactory solution by others in the Mechanical Engineering Laboratory of the Massachusetts Institute of Technology. The laws of friction between rubbing metallic surfaces, both lubricated, and without lubricant, are still open to careful research. Although the conditions of this case are comparatively simple, they are yet somewhat difficult of exact reproduction. The presence of dirt, or traces of any material, which may act as a lubricant, must produce serious errors in the result. The complete removal of oil, used in the preparation of the surfaces, has been found a matter of difficulty, and this shows that all such use of oil should be avoided. The measurements of Coulomb, Morin, and Jenkin, go far to show that with speeds from 0.1 inch per minute up to perhaps 5,000 inch per minute, the coefficient of friction of motion (kinetic friction) of many unlubricated metallic surfaces undergoes but little change; also, that the coefficient of friction of repose (static friction) is nearly, if not quite, the same as of motion. It is to be noted, however, that the magnitudes of the errors in the experiments of the first two observers are so great, that it is impossible to claim that there is no change whatever, even within much narrower limits. Jenkin's measurements extend only from velocities of 0.1 inch per minute to 8 inches per minute, about, and although quite delicate, cannot be regarded as sufficiently numerous or positive to be of conclusive weight. The experiments of Bochet, upon the friction of iron at higher speeds, from four to twenty-two metres per second = 10,000 inches to 50,000 inches per minute, were made upon the action of brakes upon railway trains, and show a decided diminution in the coefficient as the speed increases. These are all the published experiments upon this point, with which I have met, but I have not entered into a careful study of the literature of the subject. The case of friction of metals upon wood without lubricant has been studied by Coulomb, Morin, and Jenkin, with the same general result. Kimball has shown, however, a diminution in coefficient with increase of speed in this case also, but finds further that the coefficient of friction in general "at very low velocities (under a few inches a minute) is very small; it increases rapidly at first, then more gradually as the velocity increases, until a certain rate, which depends upon the nature of the surfaces in contact and the intensity of the pressure, a maximum coefficient is reached. As the velocity continues to increase beyond this point, the coefficient decreases. An increase in the intensity of the pressure changes the position of the maximum coefficient, and makes it correspond to a smaller velocity," etc. When the experiments on lubricated surfaces of whatever description are considered, it will be seen that the discrepancies are far greater than with unlubricated. This is doubtless due chiefly to irregularity in the amount of the lubricant present, to a want of sufficient regard to the nature of the lubricant used, and to other similar experimental conditions. It seems unlikely that experiments upon plates sliding upon a horizontal plane with uniform motion, would give conditions of lubrication identical with similar plates moving with accelerated motion, with shafts revolving in journals, and with disks revolving one against the other. Morin has found constant coefficients for lubricated metals, and Jenkin has arrived at sensibly the same result for very low velocities, with the exception of steel on steel with oil. For this he finds an increase of the coefficient as the speed increases. Kimball finds under conditions similar to those used by Jenkin, a similar rise in coefficient, attaining a maximum at a low speed (of about one inch per minute, or less in case cited) and then falling away towards a minimum of much smaller value (as low as one-third the maximum in one case) at high speed. The experiments of Jenkin and Kimball are on shafts upon their bearings. In the case of metals upon wood with lubricant, the general result of Jenkin's experiments point to a rapid diminution of coefficient as speed increases up to about eight inches per minute, and even higher. Observations of Morin give to these substances a static coefficient higher than the kinetic, and the remark made by Jenkin connecting these phenomena is a suggestive one. The results of Coulomb, Rennie, Morin, Jenkin and Kimball are not, I think, to be regarded as contradictory. It must be considered that the measurements by Jenkin were at velocities in inches per minute from 0.1 to 8; by Kimball, from 0.007 to 3,000; by Morin, 70 to 9,000 (certainly not reliable below 70); by Bochet 10,000 to 50,000. Thus the experiments of Jenkin and Morin scarcely overlap, those of Morin and Bochet do perhaps slightly overlap, and those of Kimball cover a range corresponding to those of Jenkin and most of those of Morin, and extend considerably below those

of the former. The results by Kimball and Jenkin are not contradictory and the data by Bochet seems to be a continuation of Kimball's results about such as might be anticipated. The field, as it is now open, would seem, therefore, to invite a careful detailed study with the whole range of materials and velocities, under conditions of accuracy corresponding to the possibilities of modern mechanical construction, so that a connected series of reliable data should be reached. Although my own work progressed but a little in the direction of the friction of solids, and none of the results are here given, I leave the above statement to present for comparison the results upon the friction of metals and those now to be described upon the friction of leather and iron. Before I had become acquainted with the methods and results of Professor Kimball, I had been led by some preliminary experiments both on the friction of blocks of wood upon inclined and upon horizontal planes, and on the friction of belts upon pulleys, to the conclusion that, at low speeds, the coefficient of friction did increase rapidly with the speed. Seeing the important bearing of this fact upon the question of the friction of belts upon pulleys, I have been led to an extension of these preliminary experiments to a more detailed study, in the hope of being able to demonstrate clearly for some special cases the law of the change of coefficient, and to thereby contribute somewhat to an interesting theoretical question and to the data used in engineering practice in regard to belting. In the case of a belt sliding over the surface of a pulley, there appears to be no objection to the use of the general formula of Morin, giving as the coefficient of sliding friction:

$$f = \frac{\log_{10} \frac{T}{t}}{0.00758 a}$$

where  $T$  = tension in tight side of belt,  
 $t$  = tension in slack side of belt,  
 $a$  = arc of contact between belt and pulley.  
 When  $a = 180^\circ$ , this becomes

$$f = \frac{\log_{10} \frac{T}{t}}{1.364}$$

This expression must not be applied to rapidly running pulleys without allowance for "centrifugal force" of the belt, but in the present study no such condition enters. A complete description of the apparatus used in my experiments is unnecessary. In principle, it was as follows:—a pulley was fixed upon a horizontal shaft, which could be kept in continuous and quite uniform rotation at any desired speed from zero to about thirty turns per minute. Over this pulley was hung the belt, whose coefficient of friction was to be measured, and to this was attached at one end (usually corresponding to the slack side of the belt) a spring balance reading up to 120 pounds, which was secured at its other end to a ring in the floor. Both ends of the belt were also provided with hooks, upon which weights could be hung.

To determine the rate of slip of the belt over the surface of the pulley, an electrical chronograph was improvised from a Morse sounder. By this were recorded seconds by means of a circuit closed by a seconds pendulum, and upon the same strip the times at which four electrical contacts were closed by a pointer attached to and revolving with the shaft carrying the pulley. A careful measurement was made once for all of the distance through which the highest point on the crowned surface of the pulley moved, when the pointer passed from each of these contacts to the next. Thus by the chronographic record, the time during which the pulley surface turned through, a known distance under the belt was given, and from this the rate of slip was deduced by a direct proportion. All rates of slip were used from the highest attainable, which were far beyond the limits of practice, down to the lowest, which were not interfered with by the friction of repose. The tables show the rates used. Care was taken in all measurements of any series with any given belt, to use as far as possible always the same portion of the belt surface. With this precaution it was found that the arrangement was very sensitive, and would give very accurate results so long as the condition of the belt surface remained the same. The following tables give some of the results obtained.

FIRST SERIES.—Belt used, three inch, single, old, leather belt, moderately clean. Pulley used, 13 inch x 4 inch iron pulley, with very smooth, polished face. Tension  $T$ , on tight side of belt = 20.3 pounds.

$t$ Pounds.	$f$	Slip. in. per m.	$t$ Pounds.	$f$	Slip. in. per m.
14.03	0.118	0.72	11.59	0.171	13.20
13.69	.125	0.83	9.56	.240	18.00
12.25	.160	3.00	9.56	.240	18.00
13.75	.123	1.15	13.34	.135	1.44
13.56	.128	1.15	13.38	.132	1.65
13.44	.132	1.32	14.47	.107	0.288
11.69	.175	5.76	14.50	.107	0.144
11.44	.184	6.60	14.56	.105	0.096
14.19	.114	0.48	5.44	.493	14.0
14.06	.116	0.48	4.19	.502	27.9
14.00	.118	0.55	3.31	.578	55.8
11.81	.173	11.52	3.19	.590	53.8
11.56	.141	13.20	6.31	.372	69.7
11.81	.137	11.52	8.06	.294	27.9



This series was made with a preliminary apparatus before the chronographic speed recorder was arranged. If the results be plotted with speeds as abscissas and values of the coefficient of friction  $f$  as ordinates, it will be found that the results are quite concordant, and that they show a great change in the coefficient with change of rate of slip. An inspection of the tables will show that with the slowest slip, 0.096 inches per minute the smallest coefficient, 0.105, was obtained; with the most rapid slip used, 558 inches per minute, the largest coefficient, 0.590 (or mean 0.584) was found. The increase in coefficient is very rapid for slow rates of slip. The consideration of such a plot for the later series, as that just suggested, will contribute greatly to a clear conception of the results. In this series no friction of repose as distinguished from that of motion was observable. Prolonging the line obtained by the plot backward to a slip of zero gives the very low coefficient of friction  $f = 0.100$ , a result which is discoverable, I think, solely because of the fact that my observations give results at such low rates of slip.

(To be continued.)

### Russian Views on British Trade.

What is regarded in some quarters as the recent successes of Russia at the expense of England in Central Asia have, it is said, given a fresh impulse to the idea, so often met with in St. Petersburg of late, that England's power and prosperity are visibly on the wane. The St. Petersburg *Viedomosti* has published a leading article, entitled "The Economical Decline of the Mistress of the Seas," in which a number of statistics in support of this assertion are extracted from the *Deutsche Rundschau*, tending to show—if they prove anything at all—that England's share in the world's business since the rise of so many competitors bears no longer the same proportion to the whole as formerly. It is stated that whereas in 1867 and 1868 England's part in the trade of the world was 25 per cent., in 1882 it had fallen to 19½, and that in the latter year her share in the export trade of Europe was 6 per cent. less than it had been eighteen years before. It is also shown that in 1883 England furnished only 40 per cent. of the coal used in the world, while in 1868 she supplied 53 per cent. of it. In cotton goods and iron produce a similar decline of over 6 per cent. is shown to have occurred during the last fifteen years. The pulse of English trade and enterprise, it is asserted, beats more feebly every year, and Berlin is becoming the most dangerous commercial and financial competitor of London.

### Alteration in the German Tariff.

Mr. Hoffmann, one of the members of the Bradford Chamber of Commerce, last month, called attention to a matter of some importance to yarn merchants and exporters, and of general interest also as furnishing one of the few instances of a continental Government voluntarily reducing its tariff. He said "the German Government had exercised a very wise discretion, under very great pressure on the part of the manufacturers in different parts of the country, who were using English material, and who were obliged to compete with the same yarns manufactured by other countries in neutral markets. The German Government had at the last allowed a bill to pass, and it would take effect from October 1st, next, by which yarns, either single or two-fold, which were really hard yarns—and in general terms this was perhaps a fair description of yarns used by the manufacturers of mixed and lustre goods in Germany—would be admitted into that country at a tariff of three marks per 100 kilo, instead of eight and ten as heretofore. Everyone would be glad if this reduction should take place without further trouble, but the German Government, while wishing every advantage to the users of English wools, also desired to continue to protect the German spinners, who were mainly occupied in spinning fine Botany wools. Therefore they had tried to find out some of the distinctions between soft yarns and hard yarns, and they had classed hard yarns as being such as were made out of wool, the staple of which was over eight inches long. Therefore yarn sent from Bradford, after October 1st, less than eight inches long would not enjoy the advantage of this reduction. The great majority of the yarns sent from Bradford were over eight inches, but there were a number of exceptions which would lead to very vexatious contentions. He thought a definition of five inches would fairly exclude the fine Botany yarns, and he would suggest that the Tariff Committee of the Chamber be requested to consider the matter and make a representation to the German Government respecting it.



During the past seven months there has been a slight improvement in the value of exports from France, particularly in raw materials for industrial and manufacturing purposes.

The Board of Trade has issued to official receivers in bankruptcy a notice that in future all sums under £2 payable as dividends, will be paid by postal order, made payable at the principal Post Office in each town. This will remove the grievance caused through the payment of even the smallest dividends by crossed cheques.

According to the *Moniteur des Soies* a meeting of silk reeler and throwsters was held at Valence, France, a short time ago. The purpose of the meeting was to unite all the throwsters in order to raise the price for throwing from 1 to 3 francs, and to adopt a series of resolutions concerning temporary suspension of production, verification of contracts, pecuniary guarantee, &c.

The authorities at the Post Office appear to be reluctant to extend to the post offices of large towns generally, the privilege now restricted to a few of the largest commercial centres, of posting letters unstamped, but prepaid in cash, where the aggregate postage of such letters exceeds £5. During the General Election the removal of this restriction would no doubt be a matter of very great convenience.

For office mucilage, put 1,000 grains of potato starch into 12,000 grains of water, and add 50 of pure nitric acid; leave the whole in a warm place for 48 hours, stirring it frequently; then boil it until it becomes thick and translucent; dilute if necessary with water, and filter; also dissolve 1,000 grains of gum arabic and 200 grains of sugar in 1,000 grains of water, add 15 grains of nitric acid, and boil. Mix the two products.

The value of the Japanese market to Lancashire manufacturers is shown by the fact that out of a total import of cotton goods amounting to £9,037,504, no less than 97 per cent. is imported from England. To the woollen manufacturers of Yorkshire the Japanese market is also of great importance; the entire average annual value of the imports of woollen goods into Japan is £1,916,634, of which England supplies £1,720,849.

The export to England of the fancy articles which form the staple of Viennese trade has shown a considerable falling-off this summer. This is attributed partly to the war alarms, which diminished the usual spring orders, and partly to the increasing competition of cheaper German wares, against which the frequent strikes among Austrian workmen and their excessive demands in the matter of wages render it impossible for this country to struggle.

A practical machinist says he has found the following mixture very effectual in preventing machinery from gathering rust: Melt together one pound of lard and an ounce of gum camphor. Skim the mixture carefully, and stir in it a sufficient quantity of fine black lead to give it a colour like iron. After cleaning the machinery thoroughly, smear it with this mixture, and allow it to remain thus for 24 hours. Then go over it with a soft cloth, rubbing it clean. Treated thus, machinery often retains its brightness for several months.

The Postmaster General announced in the House of Commons, a few days ago, that a scheme for the insurance of parcels had been settled by the Post Office, but the details were still under consideration. Some articles might be excepted from the proposed arrangement. The Postmaster would accept liability up to 20s. in the pound, on payment of one penny up to £5, and twopence up to £10. It was not proposed to pay *ad valorem* stamp duty to the Treasury, but all fees collected on insurance would be paid into the Exchequer, and come under control in the ordinary way.

The returns for British-Burmah of exports and imports for 1884-5 show a marked decrease, and are smaller than the returns for any year since 1850-81. The decrease in exports is explained by the small amount of the rice crop, and by the depression in the rice markets of Europe. The import trade had previously been much "overdone." The unsettled state of affairs in Mandalay is also assigned as a cause of the decrease. The falling off is most marked in cotton and woollen goods, gunny bags, machinery, metals, tobacco, and betel-nuts. The year has been altogether most disastrous for traders, and a large number of failures have occurred.

An ordinary leather belt cement is wheat flour boiled in oil of turpentine; but the ends must be secured by rivets, or it is not reliable. A better cement is made by soaking six ounces best glue in one pint of ale, then boil, add one and a half ounces of boiled linseed oil and stir well. Another prescription is to take dissolved glue in the form as the cabinet-makers use it, and add tannic acid till creamy and ropy. Make the leather surfaces to be united rough, apply the cement hot, let it cool and dry under pressure, and it will not need rivetting. For rubber belting take pure rubber in thin slices, two ounces, dissolve in one pound of bisulphide of carbon. This is a good cement, but if kept, thickens very soon. In order to prevent this add a solution of pure rubber, resin and turpentine.



### Receiving Orders.

Goold, J. C., 19 Union Passage, Birmingham, silk merchant.  
 Hebblethwaite, J. W., 5, Tipping Street, Cannon Street, Manchester, yarn and cloth merchant.

### Adjudications of Bankruptcy.

Goold, J. C., 19, Union Passage, Birmingham, silk merchant.  
 Hebblethwaite, J. W., 5, Tipping Street, Cannon Street, Manchester, yarn and cloth merchant.  
 Hodgson, Sophia, Carlton Road Dyeworks, Batley Carr, near Dewsbury, Yorkshire, dyer.  
 Hall, H., O Hall, and A. Hall (trading as Thomas Hall's Sons), Batley, Yorkshire, woollen manufacturers.  
 Kershaw, H., 70, Wellington Street, Leeds, Yorkshire, cloth manufacturer.  
 Kaye, A. (trading as Kaye and Co.), Great Wilson Street, Leeds, Yorkshire, cloth finisher.  
 Seabrooke, A., C. Walls, and H. Boynett (trading as A. Seabrooke and Co.), Westmoreland Place, City Road, Middlesex, manufacturers.

### Dividends.

Dewhurst, J., jun., and W. I. Dewhurst (trading as Jas. Dewhurst, jun., and Co.), Jacob Street, Bradford, Yorkshire, stuff merchants, 4s. (first), 32, Park Row, Leeds.  
 Hyde, Mary Ann, 21, Dodworth Road, Barnsley, bleacher and dyer, 3s. 1½d., Official Receiver's Office, Eastgate, Bransley.  
 Miller, J. R., 57, Wilford Road, Nottingham, lace manufacturer, John Watson, Official Receiver, 1, High Pavement, Nottingham.  
 Smith, W., and W. Sexton, Long Eaton, Derbyshire, lace manufacturers.

### Dissolutions of Partnership.

Boden, H., J. H. Vercoe, and J. C. Ambrose, 70, Wood Street, London, warehousemen and merchants.  
 Cooper, H., and T. B. Smith, 6, York Place, Leeds, Yorkshire, cloth merchants.  
 Townsend, T. W., and J. Phythian, Greetland, near Halifax, Yorkshire, woollen manufacturers.  
 Virr, A. E., and A. Bastow, Bradford, stuff manufacturers.

## PATENTS.

### Applications for Letters Patent.

Applying drag to the bobbins, pirns, &c., on spinning or twisting frames. W. J. Adeley, Belfast. 25th Mar. 9,192  
 Actuating the shuttle boxes of looms. G. Hodgson, London. 8th Aug. 9,449  
 Automatic apparatus for cleaning the cylinders of carding engines. E. Edwards, London. 25th Aug. 10,051  
 Apparatus for mules for spinning. W. Heaton and W. Catterall, London. 26th Aug. 10,089  
 Binding for carpets, mats, &c. C. E. Knaff, London. 4th Aug. 9,292  
 Baling press boxes. W. Turner, Salford. 6th Aug. 9,368  
 Bobbins. W. P. Thompson, Liverpool. 25th Aug. 10,056  
 Condenser carding engines. E. Gessner, London. 1st Aug. 9,238  
 Curling and crimping threads or yarns for astrakan, &c. O. Imray, London. 1st Aug. 9,254  
 Connecting the ends of bands for spinning and other machinery. D. Padgett, Bradford. 4th Aug. 9,285  
 Circular combs. C. D. Abel, London. 13th Aug. 9,669  
 Checking the shuttle in looms. T. Wade and J. T. Brown, Bradford. 21st Aug. 9,916  
 Carding engines. W. and R. Taylor, jun., Manchester. 22nd Aug. 9,957  
 Clips or holding devices used in machinery for finishing woven fabrics. J. Dalglish, Glasgow. 26th Aug. 10,084  
 Card-clothing for carding engines. J. T. Fallows, Manchester. 26th Aug. 10,099

Driving pulleys and drums. A. House and A. C. Wells, Manchester. 7th Aug. 9,400  
 Displaying the quality or condition of yarns. B. and C. H. Cooper, and R. Embley, Manchester. 7th Aug. 9,996  
 Detent for spinning frames. R. N. Cottrill, Manchester. 12th Aug. 9,590  
 Driving spindles. G. F. Dawson, L. Firth, and A. Ashworth, London. 26th Aug. 10,096  
 Fastener for tapes or bands for turning spindles of machinery. L. Jackson and G. Williamson, Glossop. 1st Aug. 9,230  
 Improved roller for cotton warp and similar dyeing machinery. J. Harland and S. Settle, Bradford. 25th Aug. 10,027  
 Loom shuttles. J. Magee, London. 18th Aug. 9,815  
 Looms for double pile fabrics. M. Leach, J. Heaton, and J. Bentley, Bradford. 21st Aug. 9,918  
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 Operating clearers in spinning, doubling, and preparation machinery, and in apparatus therefor. R. Hadfield and J. W. Pickering, London. 15th Aug. 9,722  
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 Weft-forks for looms. S. Cook, London. 20th Aug. 9,888  
 Wringing woven or felted cloth in an open or extended state. S. Warburton, Leeds. 25th Aug. 10,030  
 Yarns and woven and felted goods from animal and vegetable fibres, the latter being treated so as to give them qualities of animal fibres, and being applicable for use alone in the manufacture of yarns and woven and felted goods. M. Raabe, A. C. G. Skinner, and S. Henning, London. 18th Aug. 9,811

### Patents Scaled.

10,194	11,095	11,122	12,705	13,273	13,274	15,330
3,451	10,241	11,016	5,302	10,400	15,195	918
10,838	11,456	11,593	12,746	3,170	3,606	9,650
11,331	11,746	11,873	13,680	4,292	4,593	5,246
5,689	11,529	11,684	2,248	5,011	11,114	11,483
11,824	11,838	12,010	12,394	1,285	11,511	11,535
11,570	11,632	12,029	6,137			



# The Journal of Fabrics

AND

## Textile Industries.

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### Notices.

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### Suggestions for New Goods.

(By our Trade Commissioner.)



THE London trade correspondent of the *Nottingham Guardian*, while recently drawing attention to the fact that a new description of "fancy work" has sprung up amongst ladies, namely, that of painting lace for screens, fans, and other articles, suggests the idea that, in these modern days, when printing upon textiles is executed so well, that probably printing upon fine bobbin net, or net of some kind or other, might possibly be found to answer, and that if such an article should strike the popular fancy so as to be taken up by the ladies for dresses, it would prove a lucky hit for Nottingham, which is now suffering a good deal from trade depression, caused in a great measure by foreign competition. The classes of lace goods that are now being sold, as those of the "Yak" description, and the German-Swiss laces, are being disposed of very freely. *Apropos* of this fact, it is worthy of remark that foreign competition appears to be extending to fresh branches of English production, in which we used not to fear it. Nottingham was formerly untouched in

those descriptions of lace goods, in which the town excelled, and this was due mainly to the fact that foreigners did not possess such good machinery as that held by the machine-holders there, which was of a most perfect description; a good lace machine often costing £600, it being no uncommon thing for Continental manufacturers to purchase old Nottingham machines, which had been superseded by more modern improvements, and to pay long prices for them, though, on account of the recent alterations alluded to, they would be but of little more value to their previous owners than old iron. But of late, lace machines have been turned out freely abroad, and particularly at St. Pierre-les-Calais, where they are made at lower prices than English ones. In 1872, 104 lace machines were imported into Calais from Nottingham, 79 of them being new, and the remainder old ones, the average value of the former being about £660 each; but the Calais lace trade is now pushing that of Nottingham very hard. But to resume, whatever success may attend the suggestion of printing upon lace, it has occurred to us that there are many thin fabrics, upon which printing could be successfully performed, that might take with the public, and more especially if something different was prepared, so as to cause a fresh departure, as it were, from the old types and old kinds of cloths. Some years ago, there used to be a large trade done in printed muslins, which came on regularly for sale at the end of the summer season, being especially adapted for use in hot weather on account of their light and airy beauty. Perhaps, no more beautiful dress material was ever produced than the old printed muslin, and it may be a matter of surprise to many that, in these days of love for chintzes and chintz effects, resuscitated mainly by the advent of the neat pompadour chintz prints in the first place, printed muslins do not sell again, but as there is generally a reason in some shape or other for the existing condition of affairs, the solution of this may probably be found in the fact that fashion of late has decreed that fabrics should sit in close, clinging folds to the figure, in opposition to those protruding forms which used to prevail, one of which was the starched printed muslin aforesaid. These, however, as will be remembered by those who are old enough to recall the trade, used mainly to consist of moderately large patterns, and patterns far apart, to suit a stiffened fabric that was spread out, and thus would not be consonant with present ideas, but even if the old printed muslin would not take again, there is no reason why, as before said, an appropriate thin cloth of a fresher and newer description might not be found to answer. We are speaking now of a light cloth to take the place of muslin, for nothing could be better than satteens for printing, as we now find them, with their smooth and even surface. Old styles, and old classes of goods, are being reproduced in all directions, and it may even occur to many that the printed muslin, especially in small checked grounds, might sell again just as they were, only in altered classes of patterns to suit the exigency of the times. English manufacturers are, as a rule, very much behind-hand in making little alterations in their order of production, which would often result in giving a fillip to a declining or stationary trade. They are quick enough, it is said, in following the example of those in a producing centre who bring out fresh things, in slavishly imitating them, but do not sufficiently study making even those little alterations in their general practice, which often might be successfully performed. We were very much struck, the other day, with the force of this argument, while looking over the goods contained in a large furnishing warehouse in London, the principal of which is a friend of ours. Just now the jute trade is said to be very dull and restricted in Dundee, and our friend showed us some jute manufactures which he was getting from Germany, and which, it occurred to us, might just as well be produced here as abroad, if the goods were rendered saleable merely by the exercise of a little taste and ingenuity in application for an intended purpose. One article consisted of a table-cover. It was simply made of undyed jute, in the natural grey colour. Nothing, perhaps, could be more uninviting as a material, in this first stage, to work upon. The printer's aid had, however, been invoked, and round the border there ran a small pattern, beautifully printed, in which bright blue predominated, of the old familiar Greek or key pattern, worked out in different colours. In the centre was a small medallion shaped figure to correspond, not much larger than the palm of one's hand; the chasteness of

the design—the brilliancy, and at the same time, the small quantity of colour in the aggregate employed, and the general good taste displayed in working out the idea, causing it to be successful. Round the border of the cloth was a knotted fringe, consisting of the ravelled out warp, to which some other jute yarn had been added, made in the same way as the Glasgow and Paisley shawl makers knot on their shawl fringes, which is a trade by itself. Now many would consider that a fringe is scarcely applicable to a table-cloth, or table-cover rather. But here was a new departure, the fringe gave it a finish, and took away the bare look that would have existed had the plain jute cloth alone been there. Now, English makers would in all probability have spoiled the effect by putting *too much* colour with such an article—have made a too elaborate design, when the very simplicity and taste displayed in the instance adduced, constituted its chief charm. We have seen jute crumb cloths from Dundee, a mass of vulgar colouring, that bear on their face the stamp of “rubbishy” goods, when, by the exercise of a little good taste, as in that described, a much superior effect could have been produced. Another article, in the same line, was that of curtains. They were made simply of plain jute, of a coarse and somewhat open texture, that resembled a plaited appearance of the yarn used. At the edge, or border, which was made with a broad hem, and touching it, ran a pretty, but very neat, vandyked line of chintz colour as a finish, and about three inches from it, upon the curtain, was a printed border of the same character that we have described as portrayed upon the table cloth. The effect here was also very good, and the price low; yet low as that price was for a pair of curtains, we could see plainly enough there was a very large profit adhering to them, the material that was used being so inexpensive. The grand secret of their success laid, however, in the correct taste displayed in the printing; and in almost every branch of English manufacture there could be suggested something fresh that would cause a new departure, that in many cases need to be only of a trifling description. What to aim at becomes the question, and in all suggestions for new goods, manufacturers would be much assisted by the museums of trade patterns suggested by Mr. Ablett, to which we made reference in our last month's issue, if they were established in every industrial centre; for goods and examples would be exhibited, from which many practical ideas could be obtained and turned to account by appreciative eyes which could take a hint from them.

In concluding, we may as well mention that our friend, who took the pains to show us his wares, is the principal of a large furnishing house in the West end of London, that advertises to an enormous extent, and which makes an immense return. We asked him who were the class of customers who bought the jute articles described, and he informed us that they sold in the general way to ordinary customers, but, as a class, perhaps the officers who furnished their quarters, in places like Aldershot, were their best patrons. People of that stamp were above prejudice, and bought anything that struck them, and with which they were pleased, and they were free from conventional likes or dislikes, and leanings of any kind. Our friend boasted of having successfully introduced many new fabrics to the trade, in the way of house-furnishing goods, that had now made a permanent place for themselves. One article he showed us was a thick cotton cloth, a most inexpensive fabric, of the “moss” kind of pattern, that he had utilized as a material for curtains. The cloth was finished soft, and dyed a suitable colour to form a ground work, as light brown, dark buff, dark drab, &c. Upon this ground work of colour, a suitable curtain pattern was printed, the effect being very rich and handsome, while the cost was but very little more than would be that of an ordinary cretonne. We are certain that the field is amply wide enough for many more attempts to be made in the direction we have intimated than it is now customary to make, and we beg to submit these “suggestions for new goods” to the thoughtful consideration of our practical readers.

Azarine is a new dyestuff which is brought forward as a substitute for alizarine. It is the bisulphite of a colouring matter which is an azo-derivative prepared by means of the joint action of didiazo dioxy sulpho benzide and *b* naphthol. The most original feature in this invention is the introduction of the sulphonic group, the presence of which destroys the property of the other azo-colours of subliming easily. We understand that azarine is easily fixed with acetate of alumina, and that it is principally recommended for light rose shades.



## The Ventilation and Sanitary Condition of Cotton Mills.



THE question of ventilation in cotton mills, considered from a sanitary point of view, seems likely, in the near future, to become a question which employers of labour will have to consider. There is no disguising the fact that the operatives' associations are becoming a factor whose existence may not be overlooked, and, as these matters occupy a prominent position in their programme, we may expect to hear more about them when trade has ceased to be in the depressed condition from which it has lately been suffering. Should the operatives be successful in bringing this question into such prominence that one or other of the political parties should decide to take the matter up with a view to legislation, there is no doubt that many mill owners will be compelled to expend considerable sums of money upon alterations and arrangements necessary to meet the requirements of an Act of Parliament. The operatives assert that it is of as much importance to them that they should be able to follow their employment in rooms where proper sanitary conditions exist, as that they should dwell in houses which conform to the modern ideas of sanitation. Considering the number of hours they pass within the mill, there is probably some little reason in their contention, quite sufficient, at any rate, to give this matter prominence at an early date. The points which the operatives chiefly dwell upon are:—The emission of steam; the unduly high temperature; the admixture of fibre, dust, &c., in the atmosphere; the want of means by which the vitiated air may be removed, and fresh air admitted into its place; and lastly, the admission of sewer gas into the room, owing to defective sanitary arrangements. The question of emission of steam has been already dealt with by us, and as superior methods are now in vogue for producing the conditions sought for from this practice, we do not propose to further discuss it. The high temperature, the admixture of fibre, dust, &c., in the atmosphere, and the extraction of the vitiated air, with admission of pure air, may be considered, at one and the same time, as arrangements made for the removal and alteration of one, may be used equally successfully for the others. The admission of sewer gas, however, will require to be considered separately. In the course of these articles, we hope to show that the arrangements requisite to remedy most of the evils complained of, would, in a short time, repay the owner of the mill by the improved quality of work produced, and by the reduced wear and tear of many articles used in the process of manufacture.

The subject of ventilation has always been a difficult one, made more so, perhaps, from the number of different systems introduced to the notice of the public, many of which being, upon trial, found to be inoperative or unsuitable. Many of these failures may be traced to a lack of knowledge of natural laws—these laws having been disregarded when the system was on trial at the factory. In mills, where a sufficient motive power is usually found to exist, the question of ventilation need be a matter of no difficulty. Ventilation is a complex question, and may be roughly considered to consist of two sections, viz.:—The abstraction of air, and the admission of air, and these two must be considered both separately and conjointly. The removal of vitiated air will not, by itself, give proper ventilation, nor will an arrangement for the admission of pure air, by itself, give satisfactory results. The use of fans for the removal of air has not been altogether satisfactory, although some mill owners are to be found who, even now, employ them. They are very costly for the effective work done by them, and cause draughts, which are highly objectionable. Air extractors, of which several makes are now offered to the public, are superior in every way to the fan, and should always be employed in preference. It is not our place to discriminate between the different makes of these machines, though, doubtless, some are much preferable to others, doing more duty at a less expense of power and wear and tear. We advise that these machines should be rather too large for the work expected from them than too small, as the extra cost of the larger sizes is less than the proportion of extra duty obtained from them. The machines should generally be placed at the hottest end of the room. In mills, where the engine house is situated in the mill itself, the hottest end is found to be that next to the engine house. Where trouble is found from this, or similar causes, a coat or two of the new silicate varnish on the wall next to the engine house will be found to be an improvement, as it will prevent the heat being conducted to the room by the bricks, but as most of the heat reaches the room through the apertures left in the walls for the passage of shafting, it is evident that in the majority of cases this remedy would be of only slight benefit. In considering how often the atmosphere of a room requires changing, it is necessary to take into consideration, not only, the number of persons working in the room, but also the quantity of air vitiated by the gas, and also by the products of friction in the machinery. In card-rooms, as that section of the atmosphere of the room where the carding engines are situated is always more or less loaded with fibre and dust, the air should be changed oftener than would be otherwise required, and the extractors



should be placed near the carding machines. In weaving sheds, also, where warps are sized with considerable quantities of mineral matter, more extracting force is required. To obtain the best results in spinning, as well as in manufacturing, it is necessary that the temperature of the rooms should be kept as nearly equal as possible, and a good system of ventilation makes this practicable. By the use of suitable air inlets, the quality, as to moisture, of the atmosphere may also be regulated. This is an important matter, not only to the process of weaving, but, also, to the processes of scutching, carding, spinning and sizing; and whilst dry air improves the result in scutching and sizing, a comparatively moist atmosphere is necessary for carding and spinning. Instances have occasionally come under our notice where spinners have been obliged to resort to the use of steam emitted into both card-rooms and spinning rooms; a remedy which, if it is deprecated in weaving sheds, can only be more objected to in card rooms and spinning rooms. Cotton requires to be carded and spun in an atmosphere of not too low a temperature, though we are of opinion that it might be advantageously worked in a temperature lower than is usually found in mills. The rooms are heated by steam pipes, and as the atmosphere has to be of the necessary heat at starting time in the morning, the machinery having been at rest 12½ hours, it is evident that, what with the heat generated by friction and by the combustion of gas, the atmosphere of these rooms, without ventilation, must, before night, reach a higher temperature than is advantageous. But more than this must be noted. After the machinery has been at work some hours, the temperature of the air, near the ceiling, will be found to be much higher than that near the floor. We purpose at the end of this article to give the results of a series of extensive experiments upon this point. Now this increase of temperature affects materially the oil used for the lubrication of the shafting, and the strapping used for driving the machines. The acute competition of modern times has compelled the trade to pay more attention to the quality of oil used, and to adapt their oil, by mixing different sorts together, to the requirements of the different bearings it has to lubricate. Now, an oil which may be too heavy at one temperature, may be most suitable for bearings situated in a higher temperature, but when the temperature experiences great changes, an increase of friction, and wear and tear, can only result. But further, high temperatures have a very deleterious effect upon some oils, but the subject is such an important one that we propose to enter into it more fully next month. The high temperature of the air near the ceiling makes the strapping in time dry and brittle; this not only shortens the life of the strapping, but, also, reduces the production of the machine, through the time lost in replacing the strapping, and in tightening up the new strap until it has become "ratched" to its work. The influence of this heated air upon the shafting itself must not be forgotten. It is difficult to estimate the loss that has been entailed by cotton spinners from this cause also. In spinning rooms, the shafting is placed as near the ceiling as practicable, so that the down straps for the mules may be as long as they can be. It is therefore evident that it is subjected to the greatest possible variation of temperature. In consequence of this, the shafting is continually being expanded and contracted, and where the room contains long lines of shafting, the difference in the length of the shafting, thus affected, is sufficient to put the gearing wheels too deep in gear, or, not deep enough, as the case may be, to their great detriment. The side friction upon the pedestal bearings is also greatly increased by the same cause. It is always difficult to ascertain the real cause of the breakage of seemingly good gearing wheels, but we have known several cases where it evidently arose from this cause alone. The loss in these cases was quite equal to the cost of the ventilating arrangements we have indicated. The increased length of spinning mules has made the length of the down strap a matter of importance, and many old mills, otherwise suitable for mule spinning, suffer in no small degree from short down straps, which prevent the maximum production from being obtained. Variations in the temperature also affect the spindle banding. Cotton spinners are now giving much more attention to the quality of mill stores than used to be the case, and to no description more than to spindle banding. This alone would tend to show that it is important that the conditions, under which the bands have to work, should be such as are favourable. It is well known that a band becomes tight or slack according to the increase or decrease of moisture in the atmosphere. It is perhaps needless to point out that slack bands mean undertwisted yarn and soft cops, whilst a too tight band causes extra friction and wear and tear.

It is probably well known that the presence of too much moisture in the spinning room is detrimental to good spinning, chiefly, because of its influence upon the leather on the top rollers, but it is found that more moisture may be held by the air without detriment, when proper circulation of air takes place, than when no such circulation exists—of course, in any case, it is necessary to see that the air is not charged with an excess of moisture, but only that it should contain such a percentage that it does not rob the cotton in process, of its natural moisture. Where this condition exists, not only better spinning is obtained with a smaller amount of crow laps, or soft waste, but also with considerably less carriage fly and sweepings—the fibres of the cotton being less liable to be thrown off. To many cotton spinners, the way to obtain this condition may seem to be one much to be desired, but quite unattainable, still, with proper appliances, and with a little care on the part of the spinning master, it may be obtained in every mill. The first instrument necessary is a hygrometer, which is a small, inexpensive instrument, which registers the temperature and the moisture contained in the air. By watching

this instrument, the superintendent is able to so regulate the condition of the air admitted into the room, that it may be kept within a small margin of variation. At present, we know of no arrangement by which this may be done automatically, still we do not despair that, in this inventive age, some one may be found who will produce an arrangement by which this may be done. For spinning mills, we know of no system for the regulation of the air that is so practicable as the inlet system. These air inlets are placed at the opposite end of the room to the air extractors, and the air, in passing through them, is heated or damped, or heated and dried, at the discretion of those who look after their working. The air that passes through them may also be cooled. These operations are regulated by the turning of two or three taps, the time occupied being only a few minutes. With these machines, whatever the state of the weather out of doors, suitable conditions in doors are to be obtained at will; and with a constant temperature of some 75 or 80 degrees, with fresh pure air admitted at a speed more than necessary to insure perfect sanitary conditions, it would be difficult to find more healthful occupation than cotton spinning. Insurance against fire seems likely to become a matter of no little importance to owners of non-fireproof mills. In these days of steam fire-engines, a fire can only result in heavy loss to the spinner, as he is usually left with a large quantity of water spoiled machinery. We are strongly of opinion that a well ventilated mill will be found much less liable to fire (with equal attention) than those not so ventilated. Our reasons for advancing this opinion are—that much less lint or fibre will be lying and floating about, and the lubricating oil will be more certain of doing its duty.

### New Cloth Patterns for Autumn and Winter, 1886.

The new ideas for cloths in worsted, woollen and mixed warp and weft, for the Autumn and Winter season in 1886, are now being brought before the notice of manufacturers. We have a variety of these now before us, and, as in former seasons, they can be had from us in parcels of 100 samples for £2. In fancy fabrics for coatings, trouserings, &c., there are some new features, although the producers must have been severely taxed to bring out any new and effective designs and colourings when taking into account the rapid strides that have been made during recent years. In worsted trouserings there are many striped patterns, the ground work being mostly in dark shades, the stripes showing up prominently by a liberal introduction of silk, either single or twisted in two or three shades. There are not many distinct departures from recent styles, although some few samples are entirely new. Many of the patterns are backed slightly to give them weight, but the tendency seems to incline to making an admixture of woollen do this. There are also some taking patterns in checks, but these are fewer in number than those in stripes. In this class also silk is liberally introduced, and most effectively. In both sections of goods the colourings mostly in use are blues and scarlets in varied shades, although others are freely used, but less prominently. In woollen fabrics, the colourings are not, perhaps, as bright as usual, the prevailing tendency being to duller shades. In design, broken effects, both in checks and stripes, are mostly in vogue, and the warp and weft are manipulated in such a manner that excellent and well woven fabrics are produced, which are certain to find a saleable market. Knopped and curled yarns are again used, but only in small proportion for gentlemen's wear, compared with recent seasons, the former being more utilised than the latter. In tweeds, chevots, and such like cloths, the coarser counts of yarns are used, and, with few exceptions, the fabrics are produced without backings. Silk is also prominently introduced into many of these cloths to great advantage, although some good effects are had by the occasional introduction of marked colourings. The majority of the materials will make really admirable suitings and mantles. Nearly all the samples, even those made in fine counts of warp and weft, may be successfully imitated by makers of the lower classes of cloths. This applies to the worsted, woollen and mixed samples. The patterns are from the most reliable sources, and include French, English and German specialities, and to manufacturers of coatings, suitings, trouserings, in nearly all description of cloths, they will give a clear index of what is most likely to take the fancy of the general public, both at home and abroad. As stated above, we shall be pleased to forward them in parcels of 100 samples for £2, and those, sending for them are requested to state the branch of the trade they are required for, and the patterns specially adapted for their manufacture will be forwarded.



### Researches on Silk Fibre.\*

(Concluded from Page 29.)

Is not the time arrived when the British consumer should know, by the compulsory declaration of the amount of weight or adulteration, what he is really buying? I think so. I also give, from Dr. Bowman's lecture, the Composition of Wool, and also of Horny Tissue, which it resembles very closely:—

Average Composition of Horny Tissue, according to Mulder.		Composition of Wool.		
	Per cent.		Scherer.	Mulder.
Carbon .....	50.54	Carbon ....	50.65	50.5
Hydrogen .....	6.91	Hydrogen ..	7.03	6.8
Nitrogen .....	16.83	Nitrogen ...	17.71	16.8
Oxygen .....	22.07	Oxygen ....	24.61	20.5
Sulphur .....	3.65	Sulphur ....	0.00	5.4
	100.00		100.00	100.0

Dr. Bowman found that, after drying a number of samples of wool at about 100° F., and then exposing them to the air in an ordinary warehouse unheated in any way, but with a temperature of about 50° F. to 60° F., there was an average gain of 8.28 per cent. of moisture, which he terms the water of hydration. He also says:—"That on the Continent there are official and public testing establishments in many of the large manufacturing centres, both in France and Germany, where reports can be obtained in regard to the condition both of wool tops and yarn, and that it has been found, by a number of experiments conducted in these places, that if wool is subjected to the highest temperature which it can sustain without scorching, it will regain from 18 to 18½ per cent. of moisture, and that we may, therefore, regard this as its normal condition under the usual atmospheric conditions. The above analyses are analyses of the residual, or pure wool after the fat, sweaty matter and yolk, or suint, have been removed by treatment with hydrochloric acid, anhydrous ether, cold water, and alcohol in succession, and then again exhausted with alcohol and ether. The quantity of these foreign substances amounts to from 20 to 30 per cent. in air-dried wool."\* The following Table will show the position in the animal kingdom of the silk-worms and spiders, which have produced the silk described in this paper:—

#### DIVISION III.—ARTICULATA.

##### SUBDIVISION II.—Anthropoda (or true articulata).

Class, Insecta.	Class, Arachnida.	
Sub-Class, Metabola.	Order, Arachnida.	
Order, Lepidoptera.	Family, Epeiridae.	
Sub-Order, Heterocera.	Group, Orbitelariae, or Geometric	
Group, Bombycina.	Web Weavers.	
	<i>Nephilengys malabarensis</i> .	
	<i>Meta menardi</i> , Latr.	
Family, Bombycidae.	<i>Nephila plumipes</i> , Koch.	
Genus, Bombyx.	<i>Epeirida</i> sp., Adels.	
Species, <i>Bombyx mori</i> .	Family, Uroctoidea.	
	Group, Tubulariæ, or Tubular	
	Nest Spinners.	
	<i>Uroctea Durandii</i> , Walck.	
	Family, Thomisidæ.	
	Group, Laterigradæ, or laterally	
	Extended Legs Spiders.	
	<i>Voconia maculata</i> , Kays.	
Genus, Attacus.	Genus, Antheræa.	Genus, Caligula.
Species, <i>A. cynthia</i> .	Species, <i>A. mylitta</i> .	Species, <i>C. japonica</i> .
<i>A. ricini</i> .	<i>A. yamamai</i> .	
	<i>A. assama</i> .	
	<i>A. pernyi</i> .	

#### COMMERCIAL ASPECTS OF THE SILK INDUSTRY.

The necessity for the minutest inquiry into every detail concerning the economy and excellence of manufacturing silk cannot be overestimated. The fact of the Lyons Chamber of Commerce, at this late period of the history of so successful a silk industry as theirs, commencing to build a laboratory for more minute investigation, proves it. Our attention is almost compulsorily arrested by the fact of the decadence of this industry in our own country, a decadence threatened by extinction, gradual but sure. A few useful figures from the Board of Trade returns of the value of the imports into the United Kingdom, and of the exports of British and Irish produce from 1854 to 1880, ordered by the House of Commons to be printed in 1882, most seriously show this. I will only give the totals of various kinds of silk goods manufactured by countries in Europe during two decades, and purchased by England.

\*From a paper read before the Society of Arts, by Mr. Thomas Wardle, F.C.S., F.G.S.

† Dr. Bowman's Lectures on Wool Fibre, at the Bradford Society of Dyers and Colourists, April, 1885.

#### IMPORTS OF SILK MANUFACTURES FROM THE CONTINENT OF EUROPE, DECADE 1854 TO 1863.

Broad stuffs, silk and satin .....	13,679,321
Broad stuffs, velvet .....	1,364,870
Ribbons of silk and satin and other kinds .....	14,175,544
Plush for making hats .....	1,023,748
Other kinds of unenumerated manufacture, all silk, and silk mixed with other materials .....	3,470,852
Total .....	33,734,335

#### DECADE 1874 TO 1883.

Broad stuffs, silk and satin .....	63,868,365
† Broad stuffs, velvet .....	8,456,076
Ribbons of silk, satin, and other kinds .....	18,919,378
Plush for making hats .....	237,193
Other kinds of unenumerated manufactures of all silk, and silk mixed with other materials .....	26,829,560
Total .....	118,310,572

In 1855, our total imports of manufactured silk from countries in Europe amounted to a value of £1,826,525. In 1880, the total imports of manufactured silk from countries in Europe had grown gradually year by year in value to £13,085,083. Thus in 25 years we had come to buy from countries in Europe of articles we ought to have manufactured for ourselves no less than £11,258,558, an almost incredible sum. Did we lose this industry, or was it only a surplus to our then established silk industry? The distressed state to-day of Coventry, Congleton, Macclesfield, Spitalfields, and the Manchester silk districts, answers this question too painfully. The trade is gone practically, and gone from us to more skilled and persevering centres abroad, and gone, too, from our own country, which possesses the most suitable climate in the world for the silk manufacturing operations of winding, throwing, dyeing, warping, and weaving. The valuable reports of the Royal Commission on Technical Instruction, of which Commission my friend, Mr. Woodall, M.P., who has done me the honour to preside this evening, is a most hard-working member, not only fully shows how large an industry there is abroad, but insists that it is only by equal technical skill and increased art knowledge that our silk trade can be re-won. The breeding of silk worms has for a long time been a most important industry in Italy and the south of France. The total production of cocoons from these worms in Italy amounted, in 1881, to 39,300 tons, and in 1880, to 40,930 tons. In France, in 1881, the production of cocoons amounted to 20,362.179—9,090 tons and were principally raised in the Departments Gard, Ardèche, Drome, Vaucluse, Var, and by the mouths of the Rhone. French statistics show that from this large quantity of French cocoons was produced, in 1881:—

	Raw Silk.	
	lbs.	tons.
France .....	1,650,000	or 737
In Italy .....	6,523,000	2,912
Corsica and Algeria .....	6,182	3
Austrian Hungary .....	324,632	145
Spain and Portugal .....	184,800	82
Total product in West Europe .....	8,688,614	3,879
From the Levant:—		
Turkey:—		
Anatolia .....	158,400	71
Salonica, Volo, Adrianople .....	264,000	118
Syria .....	365,200	163
Greece .....	28,600	13
Persia and Georgia .....	550,000	246
Total .....	1,366,200	611

It will be seen from these figures what a very important matter it is that the greatest attention should be paid to the earlier operations in the manufacture of silk threads, and one cannot be surprised at the Lyons Chamber of Commerce starting anew to ascertain all the facts relative to the proper sizing, i.e., producing even threads of silk in a more minute and exact manner than heretofore. For if the earlier stages and operations have not for their aim and effect the production of an even thread, no after manipulation of winding, warping, dyeing, weaving, or finishing, can effectually avail in turning out fabrics of the finest qualities, in all or any of the various purposes for which silk is used. Hitherto the sizing has been by rule of thumb, and dependent upon skilled eyesight and fingers, in first sorting cocoons and afterwards reeling 4, 6, 8, or more together, according to the required thickness of thread, or what at this stage is termed raw silk, that is, the state in which it comes into the market before it is manufactured into organzine, tram singles, &c. An examination of the thickness of the ultimate fibre must then take first place, and this method has now commenced, and will be carried on in the new Lyons Laboratory, not only of all species and varieties, or, as the French call them, races, of cocoons, but of the thickness of these fibres throughout the entire length of the cocoons, which I have discovered to be very variable. Next come the important examinations of strength and tension, or elasticity, which the foregoing tables illustrate in both the silks of domesticated and of wild worms. The necessity for examinations such as these is more apparent in the manufacture of those silks which, some years ago, I ventured to designate by the name of wild. For some of the wild silks of India, for example, there is a great future, a prediction warranted by the successful employment of the principal wild silk, Tussur—or as it is termed in its vernacular, Tasar—during the

† The velvets for 1883 are included with broad stuffs of silk and satin.



last seven years. It would not be right to omit here the mention of the name of Sir George Birdwood, C.S.I., M.D., in connection with Tussur silk. In my South Kensington Museum "Handbook of the Wild Silks of India," I quoted a paper which he wrote in India, as long since as 1859, in which he advocates the desirability of an attempt being made in England to utilise Tussur silk, a suggestion which he has lived to see now abundantly realised. The extent to which the consumption of Tussur silk in Europe has reached is very large. France imported, from one port alone, last year, 8,000 bales of raw Tussur silk. Several English manufacturers have thrown during last year large quantities as high, in one instance, as 1,000 bales. The whole of these recently increased imports may be said to be badly reeled from the cocoon, much of it very badly reeled indeed, causing the European manufacturers to cry out loudly for improved reeling in the Eastern centres of production. Already has the improvement begun, and to such an extent has it been proved practicable by one of my many correspondents and collaborateurs in the East, that raw Tussur is produced from a single bave only—that is, so delicate in the improved reeling, that the beautiful raw Tussur I have here is simply the double fibre from a single cocoon, reeled into a single thread successfully, proving conclusively enough that in this, as in other species of silk, if the quality of the raw silk put in the market is defective in any way, it is not the fault of the silk-worm, which always does its work with the precision with which the honey bee builds her cell, but rather the hitherto inadequacy of perception of man to ascertain and adjust the natural variations and differences of the fibre of so wondrous a beauty, and so incomprehensible a product. If this contribution to a more exact understanding of silk fibre shall serve in however small a degree to stimulate any person in the direction towards the recovery of our almost lost industry, my object and aim will be fully served. My acknowledgements are due to my assistants, Mr. T. Rigby, and to my son Bernard, for their care and help in the examinations of silk fibre for this paper. I am indebted to Messrs. Bullock and Sons, silk merchants, of London and Macclesfield, for the various specimens of raw silk lent for exhibition.

### Ornamentation of Textiles.

(Concluded from Page 33).



BEFORE leaving this subject, we must not neglect to refer more particularly than we have hitherto done to the manufacture of tapestry, which has occupied a prominent position in some of our English workshops. Tapestry is neither weaving, in the strict sense of the term, nor embroidery, but a combination of the two, for although worked upon a warp stretched out upon the frame of a loom, it has no weft thrown across these threads by either a shuttle or any such appliance, but the warp is worked in by the needle with many and variously coloured threads.

This art seems to have found its way from Egypt, through Western Asia, to Europe, and, after the lapse of much time, to have reached England, where the handicraft was taken up by the monks, who became some of the most skilled workmen employed in its production. Although some tapestries have been discovered which were undoubtedly woven at an early date, we have no reliable record of the existence of looms prior to the sixteenth century. There have, however, been published several notices which prove that English manufactures existed in the Middle Ages. Matthew Paris tells us that among other things which Abbot Geoffrey had made in the reign of Henry I. (1100—1185 A.D.) for his church (St. Alban's) were three reredoses; the first one worked with the finding of the body of St. Alban, the second representing the parable of the man who fell among the thieves, and the third depicting the prodigal son. While in London, Simon (Abbot of Ramsey) bought looms, staves, shuttles and a sley. In 1344 A.D. Edward IV. passed a law for the regulation of the tapestry manufacture, and in 1392 the Earl of Arundel disposed by will of the hangings in his castle, which had been lately made in London, in blue tapestry, with red flowers. Later still, in 1595, the monks of Canterbury manufactured a tapestry hanging for the walls of the choir of the cathedral, which hangings are now at Aix, in Provence. In the reign of Henry VIII., about 1509, a workshop was established at Barchester, in Warwickshire, by William Sheldon, with the help of the master tapestry maker, Robert Hicks, but it was of no importance in an industrial point of view, till the 17th century. In the reign of James I., a new factory was established at Mortlake, in Surrey, by a skilled artist, Francis Crane, whose products were patronised by the King, and afterwards by his son, Charles I., for whom were manufactured a great number of hangings noted for their beauty and the excellence of their execution. Amongst other pieces wrought, Charles ordered the reproduction of the fine cartoons of Raphael representing the acts of Christ and the Apostles. These cartoons had been found in the manufactory at Brussels, where they had been lying forgotten from the time of the production of the tapestries for the Vatican, and Charles, by the advice of Rubens, bought them. Most of these pieces of tapestry, especially the acts of Christ and the Apostles, were bought by Mazarin at the sale of Charles I.'s property, after his execution, and have finally found a resting place in the "Garde Meuble" at Paris. The French Government, in 1876 sent them to the Exhibition of the History of Tapestry, where, in spite of their state of decay, the cleverness perceptible in their manufacture, and the taste displayed in the arrangement of the borders which act as a frame, gained the greatest admiration. The civil wars which troubled England after the death of Charles I., and the Puritanical rule, not only put a stop to the productions of the Mortlake

factory, but exercised a most depressing influence upon art generally throughout the country. All the formative arts may be said, for a time, to have ceased to exist, and nothing remained but a never-failing sparkling stream of poetry to prove that we have never ceased to rank amongst the most imaginative people of the world. Under happier auspices, however, the artistic sense began again to reveal itself in painting, engraving and some other branches, and these arts have continued ever since to flourish in England, and, in some cases, to hold their own in honourable rivalry with foreign competitors, and at the Restoration, when Charles II. was put upon the throne, the Raphael cartoons, which Cromwell, to preserve them for the nation, had bought at the sale of Charles I.'s goods, were once more sent to the Mortlake for reproduction. The looms of the factory were occupied in providing decorations for royal palaces until the death of its founder, 1703, caused a stop to be put to its productions. There was a workshop established in Soho, London, that tried to compete with the Mortlake, and some pieces of tapestry, descriptive of rustic scenes, have been preserved, which were woven there in 1758. There was another at Fulham, occupied chiefly in producing tapestry for furniture, in the style of that of Beauvais, but this was closed in 1735. After the revocation of the Edict of Nantes, a French refugee bought a tapestry manufactory established in England, and transferred it to Exeter, where for a time it prospered, with the help of some artisans from the Gobelins. Since that time England has entirely ceased the production of the high-class storied tapestries, and has turned her attention to low warp carpets, as well as to really woven tapestries, and to many other branches of artistic manufacture. But, although the weaving itself of textile fabrics has reached an unsurpassed degree of perfection, the art of ornamenting them can scarcely be said to have surmounted the disastrous consequences resulting from the Civil Wars and the Puritanical rule of the 17th century. Yet without a revival, our textile industries cannot hope much longer to maintain their position in the foreign market; hence the paramount duty incumbent on our manufacturers, master weavers, and others interested in the commercial prosperity of the country, to leave nothing undone that will tend to develop and foster a genuine artistic taste among the people, and especially amongst the intelligent artisans employed by them, for we must confess that we have a great amount of labour and study to pass through before we can hope to reach, much less to surpass, the skill and taste displayed by our forefathers.

### Capital and Labour.

Lord Cranbrook, speaking at the opening of the Harold Park, Bradford, recently, said—To work was not the end of men, though it was the means of making men. It was the means of ennobling men, and of teaching them what was in themselves, but there came a time when every man, whether he were the handicraftsman or the toiler by brain, was affected by his work, and he required repose and recreation in order that he might continue the work by which he lived. He trusted that in that park, which was now open, they would find that recreation and rest which they needed. After all, what was it that was to constitute a great and good and pure society. Not the absence from work. It was by doing that work honestly, earning their bread honestly, and looking the whole world in the face, not owing any man anything; but beyond all those things it was necessary that the character should be firm alike in work as in recreation. Let them play hard and work hard. Both went together, and those men who were indifferent to either were very apt to change disadvantageously both their physical and moral condition. But what, after all, was at the foundation of everything in England, as it ought to be in the whole world, was that the homes of the people should be made pure and happy. It was the tender, loving regard of the cottage fire that ought to be at the bottom of all their hearts, and it was to the efforts which are being made in that direction that he looked with much hope to the future. Social efforts were being made in every direction to bring together different classes of mankind, to show that there was no difference between broadcloth and fustian, between capital and labour, but that all were engaged in one great work—that of bringing about the happiness, and, by the happiness, the holiness and purity of the people. Ministers of religion did much, but, much as he valued their efforts, there was one man who could do more than all the ministers of religion to bring about the moral well-being of his neighbour, and that was the workman, who, with a due sense of his duty to God and to his neighbour, would not be led away by temptation to vice, but who stood a great example to men of his own quality. Such a man was doing ten thousand times more good than any man could by preaching a sermon. It was with a view of obtaining such a condition of happiness and purity that those around him had been engaged in the work of beneficence which they saw before them.



## ORIGINAL DESIGNS.

Our first plate consists of a very elegant design for a Lace Curtain, which has been drawn for this Journal by Mr. George Lees, Commercial Buildings, Kidderminster, with whose works our readers are doubtless familiar. The design may be considered as one of the best things we have yet given, and we hope that it will meet the approval of our readers. There are many purposes for which a design of this description can be utilized, but these will readily be conceived by our subscribers, and therefore we need not make any suggestions upon this point.

Our second plate consists of a design for a Leno or Gauze Fabric, which will be found described on page 48.

The third design is intended for a Brussels Carpet, and has been drawn by Mr. R. T. Lord, 97, Park Road, Bradford. The design represents the full width of the piece, viz.  $1\frac{1}{4}$  yard wide, and should be produced with variously coloured ground

### TO MANUFACTURERS AND DESIGNERS OF CLOTH.

The latest patterns of French and English Coatings, Vestings, Suitings, Fancy Cloths, Cassimeres, Tweeds, Mantle Cloths, &c. These Patterns give the latest Designs and Colourings for Cloths, for Autumn and Winter, 1886.

### 100 SAMPLES FOR £2. CARRIAGE PAID.

A remittance must accompany order, made payable to H. and R. T. Lord, the "Journal of Fabrics and Textile Industries." Office, 10, Ann Place, Bradford, England.

Those of our readers who are interested in the subject of Designing should see the Japanese Art Book, Artists' Sketch Book, and Encyclopædia of Design, particulars of which will be found on our fourth advertisement page.



**Wool.**—At the London Colonial Wool Sales, the opening of which was characterised by dullness, wool sold a little more freely, and realised rather better rates, and the sales closed with a less desponding tone, though large quantities of wool passed the hammer at a marked decline. In the Yorkshire districts, English wools have sold poorly, and profits have been cut down to a minimum. In the yarn and piece branches, there is little new business to report, and what orders have been given out have been small in volume, and at low rates. There has been a fair inquiry for America, but without any very satisfactory results. The Continental trade has been dull, and shows but few signs of improvement.

**Cotton.**—The demand for the raw material has been fairly steady, the fluctuations in tone and price, not having been considerable. The inquiries for yarns and cloth have partaken mostly of a retail character, the prices generally offered by merchants being unsatisfactory to the producers. Many additional looms have been stopped during the month, and, unless

the prospect speedily brightens, many more will cease running for a time. There has been an increased inquiry for India and China, but at prices which have prevented business being done to any extent.

**Woollen.**—This branch keeps fairly satisfactory, and seems to be the only part of the textile trade which is in any manner remunerative, still, profits are not large. Manufacturers of fancy worsteds have been especially busy recently, and the orders on hand will keep them generally employed for some time. The low tweed branch is also meeting with success, the demand being principally for the clothing trade. The production of fancy coatings and trouserings in point of design and colouring is really excellent, and the same may be said of the general finish of these cloths. In the medium qualities of goods, a fair business has been done at moderately paying prices.

**Linen.**—This branch has continued inactive, and, although there are signs of improvement, the low prices still offered for most classes of goods debar manufacturers from taking the orders offered them. Some very effective piece goods have recently been put upon the market. The jute trade has improved slightly both in production and the rates procurable, and manufacturers are looking forward hopefully.

**Lace.**—The condition of the lace trade has not undergone any material change, although a few orders for spring goods have been placed. As a rule, orders coming to hand are small and unimportant. The curtain branch has shown no signs of improvement, orders, both for home and abroad, being very scarce. Laces of nearly all kinds partake of the general dullness. Prices in most cases are unremunerative.

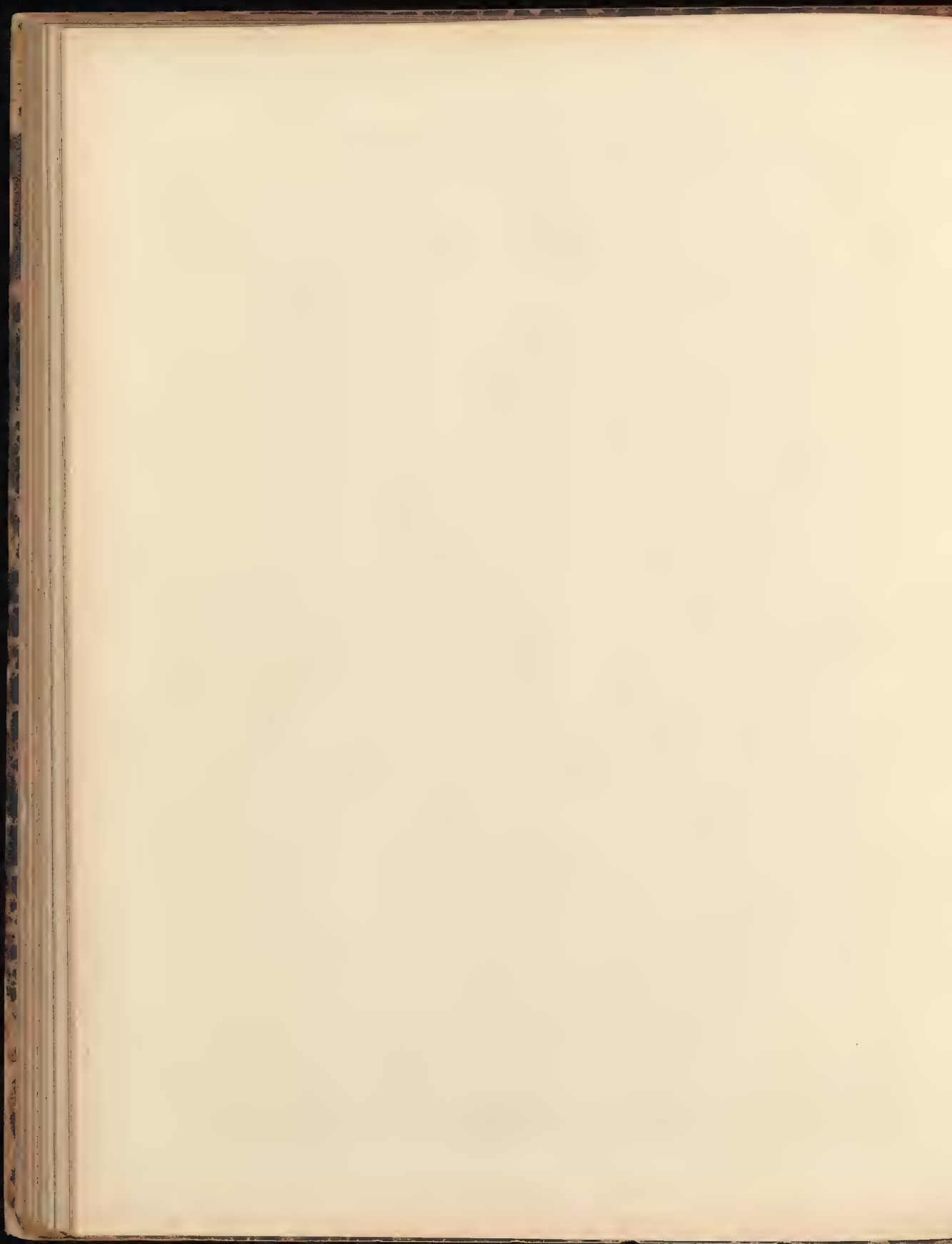
## Central and South American Trade.

The British Consul at San José, Costa Rica, warns British manufacturers that they had better look to the joints in their armour, if they would not be beaten by the United States and Germany in the struggle for Central and South American trade. In the States, a great deal of attention is being turned to the question of how to improve the trade intercourse with the Southern nations, and a Commission appointed by Congress to make full inquiries has drawn up an elaborate report. The importance of the French and German trade with the Spanish-American countries is not ignored in the report; but it is freely admitted that England has the lion's share of it, while that of the United States has been hitherto a mere trifle; as, for example, the trade with Chili in 1882 amounted to barely 3,500,000 dollars, while England's import and export trade with that country in the same year reached the sum of 70,000,000 dollars, with a large balance in favour of England. One of the chief advantages possessed by England for the successful prosecution of business with all Spanish-America is the greater wealth of English manufacturers and exporters, who can give their customers longer credit, charging six per cent. interest per annum—a transaction hitherto quite beyond the reach of American exporters. The Costa Rica Consul says, however, that the superiority of some of the American manufactures is threatening to injure the British trade. "Padlocks," he says, "are still sent to this country of Birmingham make, whose mechanism must have been invented in very primitive days;" and he compliments the Americans by asserting, as "an indisputable fact," that their unbleached cottons, oilcloths, furniture, locks, sewing machines, and many other articles are fast superseding those of European make, both in style and usefulness. There is reason to fear that the ante-diluvian padlock exemplifies a tendency too common among British exporters; but possibly the useful warning which Consul Sharpe gives may lead to amendment. The principal articles of British produce imported into Chili are cotton and woollen manufactures and iron. Columbia also is a good customer of ours for similar commodities; and the five states of Central America take from us over half a million's worth of cotton manufactures. The trade-custom here indicated is well worth keeping, and it will be a pity if the sanguine anticipation of the American Commissioners—that some day the United States will monopolise Spanish-American trade—should be realised.

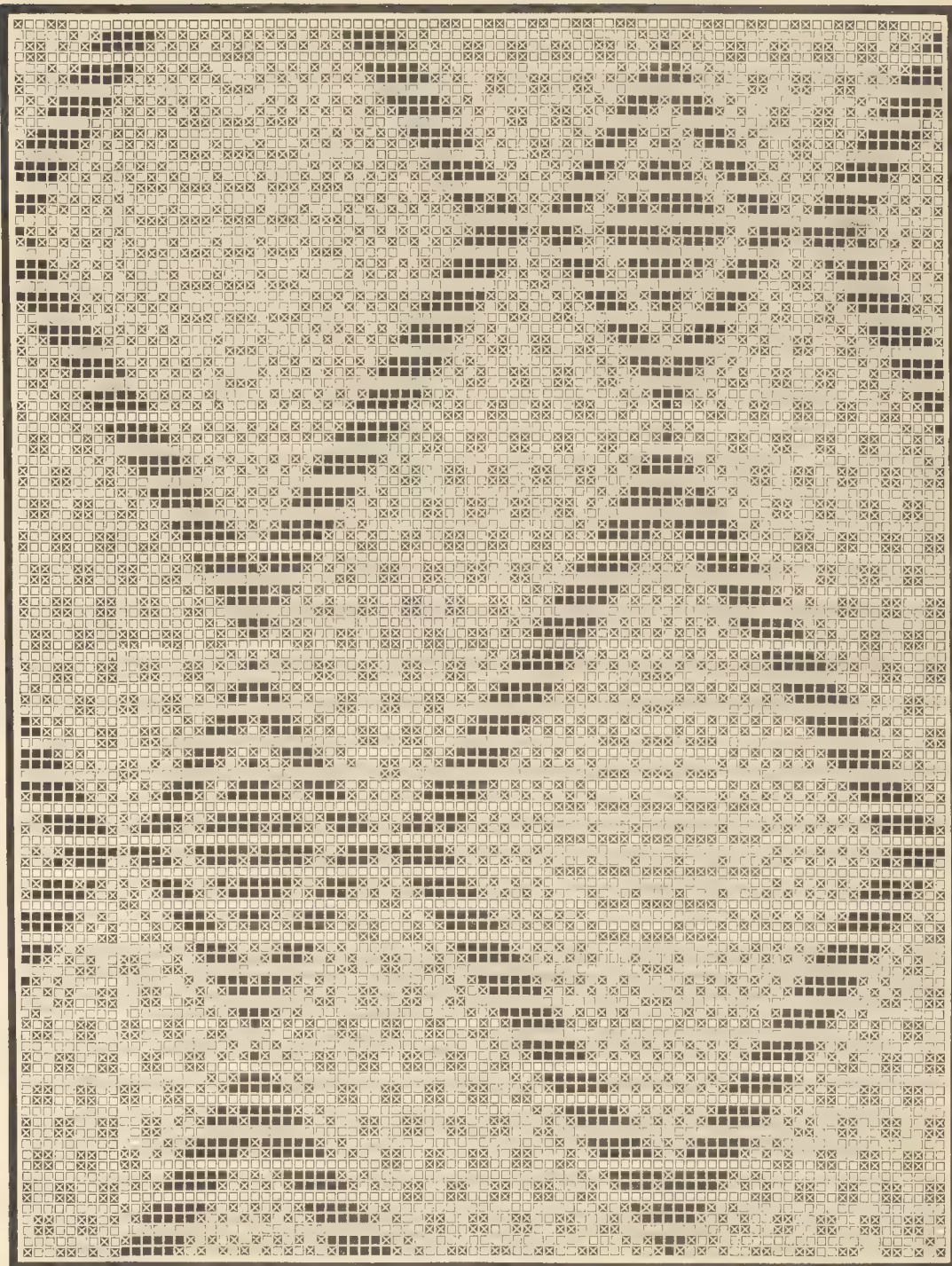




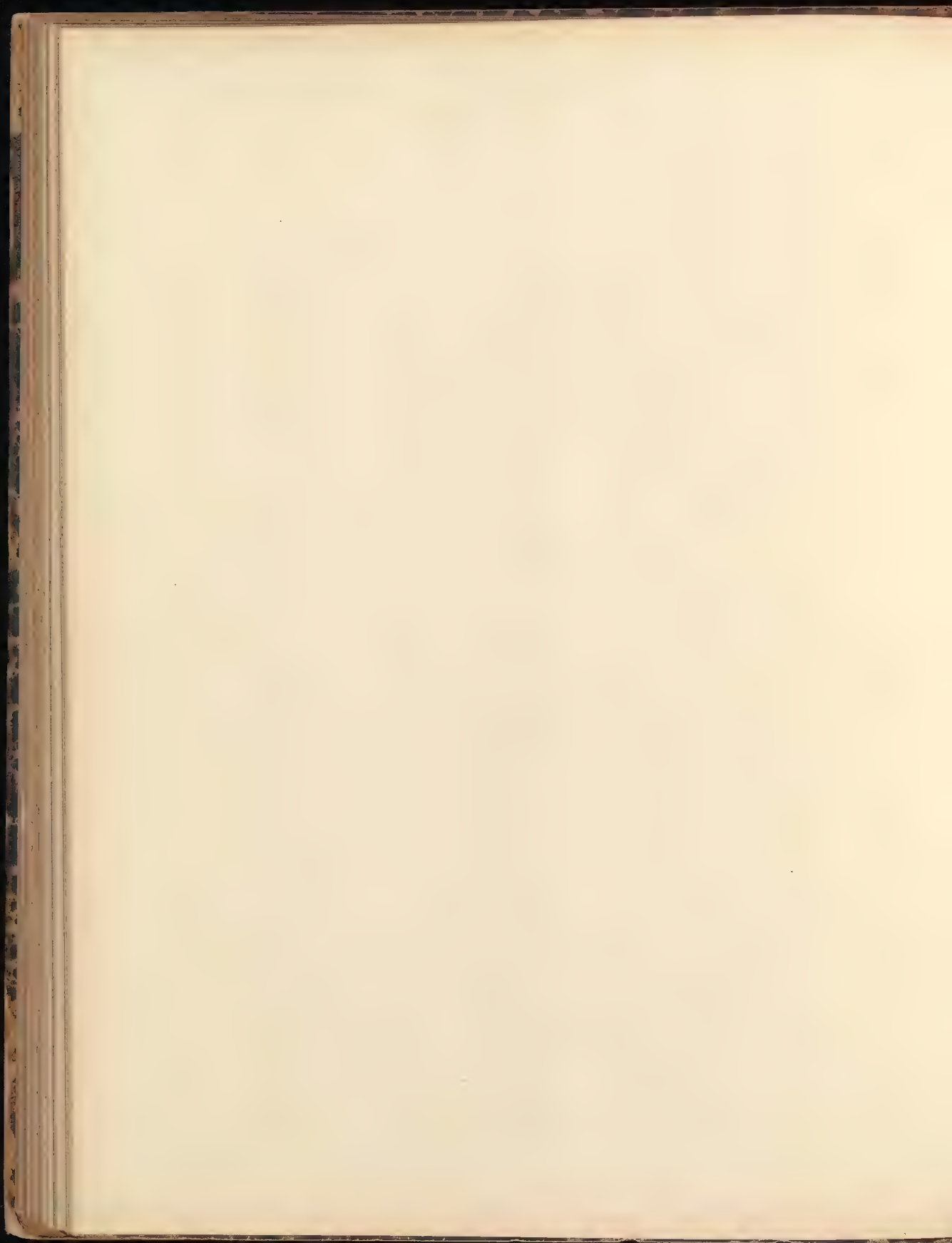
LACE CURTAIN.







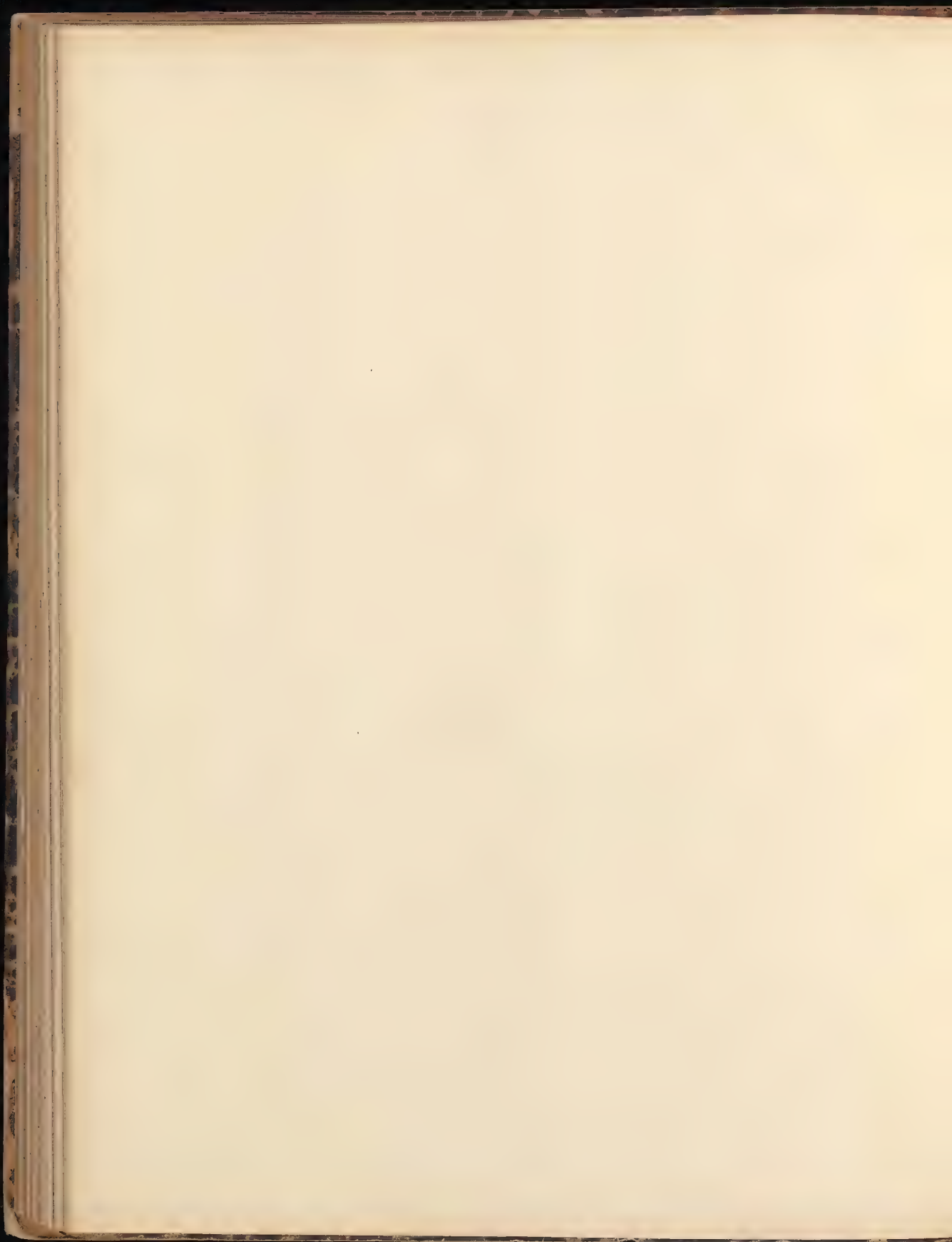
DESIGN FOR LENO.







KIDDELL'S CARPET





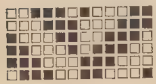


### Design for Leno or Gauze Fabric.

We give a design (No. 306) for Leno or Gauze Fabric, which will be found on our second separate plate. The particulars are almost identical with those given with the Leno design last month. Canvas leno ground, and plain and weft figure, suitable for a 20's sett, 5 picks, 2/16's warp, 10's weft, cut  $\frac{1}{2}$ . We have had this design specially woven for us, and we can therefore supply samples of it to any of our subscribers who will forward us a stamped envelope for the same.

### Trouserings.

No. 307.



Design.

72 ends per inch.

72 picks "

12's reed.

6 ends in each split. 24 ends.

64 inches wide in the loom. Weft: All 1/20 Black worsted.

Warp:

2/36 worsted.

1 Bright Blue.

4 Lavender.

1 Maroon.

7 Black.

1 Green, Orange and Blue silk.

3 Dark Bronze Green.

7 Black.

No 308.



Design.

Weft: All Black 1/20.

Warp: 2/36.

1 Dark Brown.

1 Light Drab.

2 Dark Brown.

1 Light Drab.

1 Dark Brown.

1 Crimson.

1 Light Drab.

1 Black and Blue.

1 Dark Brown.

1 Light Drab.

1 Dark Brown.

1 Crimson.

1 Light Drab.

1 Black and Blue.

1 Dark Brown.

1 Light Drab.

2 Dark Brown.

1 Light Drab.

2 Dark Brown.

1 Light Drab.

1 Dark Brown.

24 ends.

### Suitings.

No. 309.



Design.

Warp:

1 Light Blue.

3 Black.

4 White and Fawn.

1 Scarlet.

3 Black.

4 White and Fawn.

16 ends.

40 ends per inch.

38 picks "

10's reed.

4 threads in each split.

66 inches wide in the loom.

Weft:

4 White.

1 Olive mohair.

2 Red Brown.

1 Olive mohair.

8 picks.

2/36 skeins woollen.

No. 310.



Design.

Warp and Weft:

1 Organzin silk to Black woollen.

5 2-fold, 40 skeins Black "

6 " " Light Drab "

6 " " Black "

6 " " Light Drab "

6 " " Black "

6 " " Light Drab "

36 ends and 36 picks.

This makes an excellent cross pattern with the undermentioned weft:

1 Black Crimson and White twist.

5 Dark Brown.

6 White

6 Dark Brown.

6 White.

6 Brown.

6 White.

40 ends per inch.

40 picks "

10's reed.

4 ends in each split.

64 inches wide in the loom.

36 picks.

No. 311.



Design.

Warp:

6 Black.

2 White.

1 Black.

2 White.

1 Cardinal.

6 Black.

2 White.

1 Black.

2 White.

1 Cardinal.

6 Black.

2 White.

1 Black.

2 White.

1 Black.

36 ends.

Weft:

1 Dark Brown.

1 Light Drab.

1 Dark Brown.

1 Cardinal.

1 Light Drab.

1 Black and Blue.

1 Dark Brown.

1 Light Drab.

1 Dark Brown.

1 Light Drab.

1 Dark Brown.

1 Light Drab.

1 Dark Brown.

6

12

6

24 picks.

64 ends per inch.

64 picks "

16's reed.

4 ends in each split.

64 inches wide in the loom

### Mantle Cloths.

In a former number appeared a paragraph containing some particulars regarding a new departure in the manufacture of fabrics, which were intended to become very popular. We allude to those materials in which Kyrle (or curled) yarn is introduced, and for which we gave several designs, samples woven from which were lying at our office for inspection by those interested. Judging by the number of manufacturers who have availed themselves of the opportunity of seeing these samples, we feel that our information must certainly have come upon them as news. Nor was the paragraph in the least degree unreliable, for as an evidence of this, we need only called attention to the large variety of goods now displayed in which Kyrle yarn enters largely. These comprise the heavy makes of cloths for mantles, the face of which is almost entirely covered with large or small curls. Then there are cloths of a similar weight, but only partially covered with curls, either dotted indiscriminately, or arranged in narrow stripes down the length of the piece. In stockinettes, some beautiful things have been produced, which should take the market well, as they are vastly superior in appearance to the plain makes. In dress materials, no less than in mantles, has the Kyrle yarn been introduced, and so great is the variety that the most fastidious taste can be easily suited. There are self-coloured fabrics with curls all over, there are others with variously coloured stripes, with the same curled effect running along the stripes, and many others, too numerous to mention, which all show the great popularity which this Kyrle has already attained, and from the manner in which it has been utilized in the production of goods which will so becomingly adorn the fair sex, we should be inclined to predict for it a popularity for some time to come.

In recalling the paragraph to the notice of our readers, we should like to observe that the information thus given is but a

sample of many valuable hints thrown out at various times in the pages of our Journal. And we may here remark that we should like manufacturers generally to give more attention to textile publications, as the result could not but be practically beneficial to them. In this country, many manufacturers are rather inclined to suppose that what they do not know, or cannot learn through ordinary business channels, is not worth knowing, and these gentlemen are heard to say that they have no time for reading textile literature—thinking, of course, that the time so devoted is wasted. But those who differ in opinion from them best know how much time they throw away, or how much they gain by giving a little attention to publications which deal with their manufactures, and we are quite sure that if some manufacturers would descend from the lofty pinnacle upon which they set themselves, and thus condescend to recognise the fact that however clever one may be, there is always something to be learnt, even from textile literature, they would be greatly benefitted by it.

### Friction of Leather Belts on Iron Pulleys.

From "The Journal of the Franklin Institute," by SILAS W. HOLMAN.

(Continued from Page 34.)

SECOND SERIES.—Belt used same as in first series. Pulley used same as in first series. Tension  $T$ , on tight side of belt, 50.4 pounds.

$t$ Pounds.	$f$ Slip. in. per m.	$t$ Pounds.	$f$ Slip. in. per m.
34.0	0.125	25.6	0.216
36.2	.106	35.7	.170
34.4	.122	36.1	.106
33.0	.135	36.5	.103
31.2	.153	35.6	.111
28.9	.177	37.1	.098
26.1	.210	34.5	.121

This series is in substantial agreement with the first series, showing that within these limits of pressure the coefficient does not vary with the pressure. The strain in the second series is about that of ordinary running belts.

FOURTH SERIES.—Belt used, two inch wide leather belt with surface rather dry and polished by use. Hair side of belt to pulley. Pulley used, ten inch iron; face, dry and well polished. The chronographic speed record was taken in this and all subsequent series, and groups of observations were taken on various days. Temperatures and humidities were also observed, and although the groups on different days showed slight, constant differences from each other, yet no connection between these differences and the humidity could be traced. There were in all about 180 experiments made. The following table gives mean values taken from a curve drawn through a plot of those which were made with 100.8 pounds on the tight side of the belt. The maximum coefficient of friction of repose found in this series was 0.242.

Slip. in. per m.	$f$	Slip. in. per m.	$f$	Slip. in. per m.	$f$
1.5	0.192	40	0.291	500	0.572
2	.196	50	.301	550	.592
3	.203	75	.325	600	.611
4	.210	100	.347	650	.629
5	.217	150	.386	700	.646
6	.223	200	.420	750	.663
8	.233	250	.450	800	.679
10	.241	300	.478	850	.695
12	.247	350	.504	900	.711
15	.254	400	.528	950	.726
20	.264	450	.551	1,000	.741
30	.280				

FIFTH AND SIXTH SERIES.—A subsequent series (fifth), of about fifty measurements in all, showed the same general variation of  $f$  with the rate of slip with loads of 50.8 pounds on the tight side of the belt, and all of the results showed a gradual diminution of coefficient for any given rate of slip as the belt became progressively more dry and polished from friction on the smooth pulley. This lessening amounted to nearly 15 per cent. between the first group of experiments and the last one made, indicating thus the large change to which a belt may be subjected from wear in continual usage. A series (sixth), with the same pulley and belt, but with the flesh side of the leather to the pulley, gave coefficients substantially the same as the two series just referred to, but about 15 per cent. lower than the average values obtained with the other surface of the belt.

SEVENTH SERIES.—Belt used, a four inch, soft, thick, clean leather belt, which had been used, but was in good condition. Hair side to pulley. Pulley, the same as in fourth series. The group  $m'$  was the first

one made with this belt, and will be seen to show a striking increase of  $f$  as the slip increases. The group  $m''$  immediately succeeded  $m'$  and shows coefficients much larger than does  $m'$  indicating an increasing coefficient of friction as the surface of the belt was more used. The measurements of a succeeding group agreed substantially with those of  $m''$ . Group  $o$  was made under precisely the same conditions, except that the load on the tight side of the belt was  $T = 101.3$  pounds instead of 51.3 pounds as in  $m'$  and  $m''$ . If these results be plotted, it will be seen that the resulting lines are much more convex upward than those for the fourth series, showing a much more rapid increase of  $f$  at small rates of slip, and a less rapid one at high rates. This appears to result purely from the nature of the belt. Other kinds of belting would doubtless show materially different changes of  $f$  with changing speed.

SEVENTH SERIES.				EIGHTH SERIES.			
Group $m'$ .		Group $m''$ .		Group $o$ .		Group $q$ .	
Slip.	$f$	Slip.	$f$	Slip.	$f$	Slip.	$f$
in per m.		in per m.		in per m.		in per m.	
1.39	0.120	2.80	0.158	0.68	0.132	1.36	0.301
2.81	.130	2.80	.152	2.79	.145	2.80	.308
5.16	.144	1.36	.140	5.14	.164	5.14	.315
9.17	.168	5.16	.169	9.11	.188	9.11	.336
17.0	.195	9.15	.192	17.0	.233	16.9	.356
50.0	.274	17.0	.235	16.7	.233	16.9	.356
120	.387	48.6	.348	48.0	.263	31.3	.384
180	.435	48.0	.346	31.1	.315	50.0	.417
240	.508	120	.508	45.6	.357	120	.511
480	.600	240	.663	120	.580	180	.544
720	.625	480	.745	240	.725	240	.461
960	.748	Repose	.146	480	.793	480	.726
$T = 51.3$ lbs.		$T = 51.3$ lbs.		5.17	.169	Repose	.315
				Repose	.163	$T = 50.8$ lbs.	
				$T = 101.3$ lbs.			

EIGHTH SERIES.—To test somewhat the effect of lubrication, or of the oily condition into which belts often get in running, the two-inch belt used in the first and second series was soaked with sperm oil, and the pulley face was also thoroughly oiled. Two groups of measurements showed substantially accordant results, and one of them is given in the group  $q$  in the table. A comparison of this group, or a plot from them, with the results of series first and second, will show that the coefficients  $f$  for the group  $q$  are much larger than for these, and that the increase of  $f$ , as the rate of slip is greater, is less in group  $q$ .

#### COMPARISON WITH RESULTS OF EXPERIMENTS BY OTHERS

From the data given by Professor A. S. Kimball, I deduce the following table. A comparison of this with my results will show that the increase which he finds in  $f$  is even greater than any which I have found, but that the coefficients are on the whole much larger. He gives

Slip. in. per m.	Rel. Coeff. of friction.	$f$	Slip. in. per m.	Rel. Coeff. of friction.	$f$
0.37	0.42	0.264	15.4	0.78	0.491
.52	.44	.277	34.1	.86	.541
1.1	.48	.302	80.3	.96	.604
2.3	.53	.331	104.5	.99	.623
2.9	.55	.346	228.8	1.00	.629
4.4	.58	.365			

also the following table of relative coefficients (but without data sufficient for the computation of  $f$ ) in which he finds a maximum of  $f$  at a speed of 660 inches per minute and a diminishing value of  $f$  at higher speeds.

Slip. in. per m.	Rel. Value of $f$ .	Slip. in. per m.	Rel. Value of $f$ .
18	0.82	1,190	0.96
92	.93	1,980	.82
660	1.00	2,969	.69

I find no such maximum at speeds of slip up to 1,000 inches per minute, nor from my results is any such maximum indicated. This fact, however, does not, of course, in any way demonstrate or even indicate that there is not a maximum at high speeds. If there is, however, it must be beyond the range of the ordinary practice of belting. Morin's experiments on the friction of leather belts, or iron pulleys, gave  $f = 0.28$  about. This result would correspond to a slow velocity of slip on the belts and pulleys used by me. An examination of the statements made by Mr. Towne will show at once that his manner of obtaining uniform results, "By being careful that the final weight was such as to produce about the same velocity of the slipping belt in all experiments" was a necessity solely from the reason that the coefficient of friction can have a given value at one velocity of slip, and at no other. It will also be seen that, in neglecting to make measurements at other velocities than that used (viz., 200 feet per minute), he overlooked the chief source of discrepancy between the results of various workers upon the subject, and obtained a result containing a purely arbitrary condition, viz., that of the velocity of slip at which his coefficient of friction was measured. The reasons why this high velocity gave good results, and why "it was found impossible to obtain any uniformity in the results, when the attempt was made, to ascertain the minimum weight, which would cause the belt to slip," are evidently these:—First, for small velocities of slip, the coefficient of friction varies very widely for small actual differences in velocity—differences too small to be readily detected. Second, at high velocities the coefficient varies very slowly with change of velocity of



slip. It is, of course, impossible to compare the experimental value  $f=0.5853$  found by Towne, with any result obtained by me, because there is no probability that the belts and pulley surfaces used were at all the same in the two cases, and my results were not made at velocities above 1,000 inches per minute (83 feet). An inspection of my tables will, however, serve to show that, with all belts used, I have obtained values of  $f$ , both greater and smaller than that of Towne. The experiments of Mr. Towne, as is well known, were made by causing the belt to slip over a fixed pulley at a definite rate, and noting the weights used on the ends of the belt. Mr. Edward Sawyer finds the weight on the slack side, which will just suffice to stop the slip of the belt loaded with a constant weight at the other end and hung over a fixed pulley. He consequently finds coefficients much smaller than those of other observers, because the velocity of slip when the weight is finally adjusted is very small. He finds that "on polished cast iron pulleys, hard new leather belts require fully 75 pounds to hold 100 pounds; but usually the ratio is between 60 and 70 (slack side) per 100, corresponding to coefficient of friction from 0.17 to 0.12. Pieces of old belting, and thoroughly oiled, averaged better; some trials went as low as 56 per 100 ( $f=0.19$ ). Rawhide belting appears to hold very well, giving an average a little over 60 per 100. Rubber belting averaged a little under 60 per 100." The method is, of course, open to the same line of criticism as that of Mr. Towne; for the coefficient determined was that corresponding to the slowest possible rate of slip, and the assumption of this as a standard rate, or as a rate at which the coefficient should be determined, is purely arbitrary. That this is the minimum coefficient is true, but that the use of the minimum coefficient will give the best results in practice is not proven. In point of fact, the coefficient which is actually in action in the average running belt is probably much larger than this. My own experiments also show me that the smallest coefficient obtainable from various belts does not correspond to the same rate of slip. Some belts begin to "stick" at higher rates than do others; and as the change of coefficient at these slow rates is very rapid, the assumption of the minimum observable coefficient made by Mr. Sawyer is doubly arbitrary. My own experiments show clearly enough wherein one principal point of divergence between the various carefully devised rules for calculating belting lies. Some of these are based upon coefficients of friction derived from experiments at low rates of slip, some at medium rates, some at high rates, others are based directly on "good practice." If the same belt and pulley had been used by all the observers above quoted, each following his own method, the results would have been nearly as discordant as they now are. The question still remains, which is the best rule to follow? This I am not prepared to answer directly, for there remains an element still to be experimentally determined, viz:—the rate of slip which exists in properly running belts on main and counter-shafts. That some slip, apart from the known "creep," always exists, can hardly be doubted. It is from measurements of the rate of this slip, which might easily be made by those having large and small belts running under suitable conditions, that further advance in the application of friction experiments to practice must come. The results will probably show that the coefficient to be adopted, depending necessarily on the slip to be allowed, must vary with the kind of work which the belt has to do. Apart from considerations as to the strength of the belt, it will be seen that a loose belt required to transmit an amount of power proportionate to its size, would slip upon the pulley at a gradually increasing rate, until such a rate was attained that the coefficient of friction was large enough to maintain the requisite tension difference between the sides of the belt. If the belt were tightened, a less difference in tension between the two sides would suffice to transmit the required power; therefore, the rate of slip and coefficient of friction brought into action would be smaller than before. If the belt were too loose, the slip would become abnormally large, either injuring the belt by excessive wear, or throwing it off the pulley. With too tight a belt on the other hand, the friction and flexure of the shaft become excessive. The size of the proper belt to be used for given work will be determined by these two limitations and that of avoiding an undue width of the belt. Since there is, for any given belt, so wide a variation in coefficient, which may be called into action as the slip changes slightly, it seems that exact computations will never be desirable in estimating the size of belting, and that the study of the laws of the friction of belts, at least on iron pulleys, will serve rather to give to the intelligent engineer a scientific guide to the limits within which the work of a belt of given size must be restricted, than to give him a fixed factor with which to compute the exact dimensions of a desired belt. The extension of such studies, as the incomplete one which I have detailed, to covered pulleys and under various other conditions, would doubtless develop many points of interest and value.

Cotton-picking is now chiefly done by hand, but an American inventor has brought out a mechanical picker. It is mounted on wheels so as to bestride a cotton row, and the machine is double, so as to glean each side of the row. The cotton is caught by numerous teeth, which are afterwards cleared of it by means of rapidly revolving brushes. The cotton is then sent into a receptacle, where it remains until taken out by hand. The picker plates set with teeth traverse the whole of the cotton plant where there is likely to be any cotton, and strip off the wool while letting the branches and leaves pass through. The machine weighs 800 lbs., and is estimated to pick four bales per day, or, in other words, to do the work of 60 hands.

## In Alumina Mordant Discharge on Vat Indigo Blue.

Monsieur Albert Scheurer pointed out to the Mulhouse Society, as far back as 1878, the properties possessed by certain sulphate and metallic chlorides, and their effects on a cloth dyed with vat blue when steamed in essence of bichromate of potash. A mixture of bichromate and of chloride of alumina allows the discharge of the blue in one minute of steaming.\* The discharge is perfectly regular, and does not require any extra precaution. On employing the continuous steaming apparatus of Mather and Platt, the colour produced will be a clear lemon yellow. The reaction produced on the fibre will be chromate of alumina, chromate of chrome, oxide of chrome, and of alumina. If the steaming is too much prolonged, chromate of chrome is developed, which is objectionable. After steaming, the goods must be washed in water, then dyed with alizarine at a low temperature, and soaped. The red thus obtained does not possess the brightness nor the transparency of that given by the alumina mordant dyed with alizarine and revived. It is more or less dulled, and shows violet and grey shades. This brown lac is not the only cause which contributes to tarnish the red, and the author thought it not impossible that a certain product of the decomposition of the indigo contributed to fix the oxide of chrome, and thus to injure the shade. He came to this conclusion after making a number of experiments, using a different process to that described, but which were analogous to the employment of bichromate of potash. The process employed was that which has been practised many years, and consists in printing a mixture of oxalate of alumina and oxalic acid on indigo vat cloth, using bichromate of potash. There is produced on the fibre a mixture of oxalate of alumina and of chrome, which, after passing through into the ungumming bath, retains a small amount of oxide of chrome. If there is introduced into the colour a strong excess of oxalic acid, the alumina is thoroughly fixed by using gas ammoniac immediately after printing, and the chrome is discharged on washing. If, however, the cloth is passed instead through chalk water, the chrome is fixed, and the alumina discharged. When in the presence of a mixture of two oxalates, the chrome retained by the alumina, after the suspension in ammoniac, is not in any sensible proportion. M. Scheurer made experiments with (a) a white sample of cloth; (b) a sample dyed with indigo blue. Both of them were prepared with bichromate, and he printed on the two simultaneously with a colour formed of a mixture of oxalate of alumina and oxalic acid in excess, after decomposing the whole of the bichromate. The discharge was instantaneous on exposing to ammoniac gas. The pieces were washed and dyed together with alizarine. The dyeing was followed by soaping. On comparing the red obtained in each case it was discovered that the white sample was brighter than the other; the discharge of the indigo was thorough, and the destruction of the colouring matter complete. M. Scheurer concludes from this that it is not improbable that some product of the decomposition of the blue had retained some of the oxide of chrome.

## Commercial Failures.

According to *Kemp's Mercantile Gazette*, the number of Failures in England and Wales gazetted during the four weeks ending Saturday, September 26th, was 324. The number in the corresponding four weeks of last year was 231, showing an increase of 93, being a net increase, in 1885, to date, of 542. The number of Bills of Sale published in England and Wales for the four weeks ending Saturday, September 26th, was 919. The number in the corresponding four weeks of last year was 963, showing a decrease of 44, being a net increase, in 1885, to date, of 498. The number published in Ireland for the same four weeks was 70. The number in the corresponding four weeks of last year was 49, showing an increase of 21, being a net increase, in 1885, to date, of 35.

\* The colour employed was composed of 150 parts chloride of alumina 34B, 60 bichromate of potash, and 790 starch water.

### Worsted Yarn Weaving in Saxony.

Worsted yarn weaving is principally carried on at Greiz and Gera, but in the Saxon Vogtland some 3,500 power and several hundred hand looms are employed. This industry has of late years developed considerably, because the markets increase continually, and the manufacturers, by supplying superior goods, have learnt how to please their foreign customers. Goods are now sent to the North of Europe, to Russia and England, as well as to America and even to France. Last year the depressed prices for wool and worsted yarn had an extraordinary effect on the industry, which almost during the whole year was abundantly employed. Black cashmeres, which easily found buyers in all shades, were manufactured in large quantities. Heavy goods went particularly to the East, as well as to England and America. The new commercial treaty with Spain gave a great impetus to the trade with that country. Cashmere brings to the manufacturer small profit, but it has this advantage, that it can be made in time of quiet business. Other clothing stuffs in worsted yarn were in large demand, both in plain and pattern goods. Jacquard stuffs were made in small floral designs. In dress goods stuffs much was made for ladies' mantles, jackets, and cloaks, the demand being at times so great that it could not be supplied. The Berlin trade took a large quantity of goods. At the beginning of this year fashion favoured the dress stuffs manufactured out of hard worsted yarn (English weft and mohair yarn), and the consequence was that our worsted yarn weavers here had but little to do. Cheviots were principally made by the hand weavers of the Glauchau and Meerane districts. In spite of the increased exports, a slight decline in prices must be noted, owing to the severe competition. As to the width of the pieces, 60 cm. is now little in favour, 105—110 c.m. being most required. The 400 new power looms, which during last year were added to the worsted yarn industry of the Plauen district, were for the most part made by the Sächsische Maschinenfabrik at Chemnitz, these being wider than the English and also easily adjusted for dress stuffs. At present, cashmere is little manufactured, its place having been taken by rough cloths and small loop stuffs, which are largely bought for the winter.

### The Trade Commission.

A special meeting of the Macclesfield Chamber of Commerce has been held under the presidency of Alderman Wright, (Chairman of the local branch of the Fair Trade League), to formulate replies to the questions sent by the Trade Commission. The Chamber applied itself to answering for the silk trade, including the throwing and spinning of raw and waste silk and hand and power-loom weaving; also the manufacture of union fabrics, such as cotton and silk and spun and pure silk, together with dyeing. The trade of Macclesfield was reported to be £500,000, and of this about £100,000 went abroad. This trade was at its normal level in 1862, above that level during the Franco-German war, and below it at the present time. The present symptoms of the trade are said to be gradual decay. The majority of the Chamber, which only partially included the manufacturers of the town, asked for the imposition of import duties on silk advanced beyond raw and manufactured goods from foreign countries; also a federation of the Colonies, so as to bring about free exchange between them and the mother country. The minority strongly protested against this open proclamation of "Protection," and the meeting was adjourned for a week to revise the answers and to further consider the replies to be given to questions 13 and 14.—Mr. W. C. Brocklehurst, the Liberal candidate for the Macclesfield division of Cheshire, has addressed a meeting in the Town Hall, Macclesfield. He devoted a greater part of his remarks to a consideration of the causes which had led to the decline of the silk trade—the staple industry of Macclesfield—and said he thought some protection of that trade was necessary. The source, however, to which they must look for its revival was the establishment of a system of State paid compulsory technical education, by which British workmen would be placed on a par with their Continental neighbours. While he did not think the Royal Commission which had been appointed to inquire into the state of trade would do much good, he did not object to it, and urged that it was the duty of all, who could do so, to give evidence before it.

### The Manufacture of Leno and Gauze Fabrics.

Merchants of nearly all classes of textiles have recently turned their attention to fabrics of the Leno and Gauze description. In the worsted and cotton districts, especially, has this been the case, and to such an extent, that manufacturers are producing these materials for the Spring and Summer seasons in 1886. In the Bradford district, some excellent patterns have, during the past few weeks, been woven and submitted to merchants, with a result which promises, in the long run, to be very satisfactory. A great number of these patterns have been woven by an improved jacquard harness, manufactured by Messrs. M. Priestley and Co., Copley Street, Little Horton Lane, Bradford, and they have been produced in elaborate designs. The harness is adapted for weaving worsted, woollen, cotton, or silk warps and wefts, and manufacturers of all these classes of goods have given orders for it. In the Lancashire districts also, it has met with great success, most of the leading manufacturers having visited the above works to see it in operation. The harness, for which a patent has been taken out, is simplicity itself; at the same time it is very effective and economical. Patterns of cloth, woven by it, can be procured on application to Messrs. Priestley and Co., who will furnish particulars required.

### Machine for Fulling, Mordanting, Dyeing, and Brillianting Tissues.

M. Grison's appliance (described in the *Jacquard*) consists of a first horizontal roller, resting on a frame and worked mechanically. Four vertical standards maintain above the said roller, and in the same vertical plan, a certain number of rollers of smaller diameter, around which the pieces to be finished are rolled. The last roller is surmounted by a full metal cylinder, which exercises a pressure upon the whole. A box serves to heat the tissues by steam, unless the whole apparatus is established in a vapourising chamber, or steam apparatus vat. In fulling the tissue, the first step is to impregnate each piece with soapy water before proceeding to the roller. If it is proposed to mordant, dye, or brilliant, the preliminary immersion is made in a bath of mordant of dye, or mucilaginous water. In any case the rollers above are brought nearer and nearer by the lower roller, which receives the driving power. The operator must take care that the direction of the rotation determines the tightness of the roller. The finish obtained by this process is said to impart to the tissue particular brightness and glossiness.

### Belt Contact.

The weight of authority is so strongly in favour of running leather belts with the grain side to the pulley, says the Mechanical Engineer, that the question ought to be regarded as settled beyond the need of further discussion. The relative value of a belt with grain side as compared with flesh side contact has been determined by experiment with substantial accuracy. It is a friction more than one-third greater, or, say 34 per cent., with the former than with the latter application. The main reason ordinarily assigned is the advantage derived from the smoother surface, closer contact and better adhesion. But there is another ground for giving the grain side the preference which is of equal practical importance. As stated by the Sewing Machine News, the reason for placing a belt with the smooth side on the pulley is that the flesh side is stronger against rupture, having more than twice the strength of the smooth side, and the belt is thus less subject to wear and less liable to crack on the smooth side. It is better to crimp the grain side than to stretch it, as is the case when it is used outside. If a pulley is covered with leather, grain side out, so that two leather surfaces come in contact, grain against grain, there will be more adhesion, which will be increased by using castor oil as a dressing.

The following is said to be a good lubricant for heavy bearing:—Dissolve the best white lead in good machine oil, make it pretty thick, take all the clotty substance away, then add the remainder, and you will find a good lubricant.



### The Use of Oxalate of Antimony.

This new product has largely occupied the attention of the Mulhouse Society, and it was thought at first that its employment as a mordant would be very extensive in the future. A member, M. E. Jacquet, has come forward with his views on the subject. He says that it possesses certain inconveniences, which are not compensated for by its cheapness in price compared with tartar emetic. He holds that it is not likely that this oxalate will drive tartar emetic out of use. M. Jacquet, however, writes to the Mulhouse Society stating that a process he has will not only render its employment considerable, but will allow of the oxalate supplanting the emetic completely for steam styles. Methylene blue can be fixed more completely with the oxalate than where the emetic is employed. The colour the author uses is composed of methylene blue dissolved in acetic acid and tannin in the usual proportions. About twenty grammes of basic oxalate of antimony per litre are used, and forty grammes of oxalate of ammoniac. A small quantity of the latter is also added to the rinsing liquor. The basic oxalate of antimony is readily obtained by the precipitation of the double oxalate by ammoniac. The basic oxalate thus obtained is extremely soluble in oxalic acid. It dissolves during the steaming in the acid resulting from the dissociation of the oxalate of ammoniac and helps to form the tannic lac. It is best to wash off the pieces in chalk, as, by doing this, the excess of oxalic acid is neutralised.



A varnish compound of 120 parts of mercury, 10 parts tin, 20 parts green vitriol, 120 parts water, and 15 parts hydrochloric acid of 1.2 specific gravity, furnishes a good coating for iron exposed to the wet.

Glass bearings for journal boxes, glass shingles, glass pulleys, etc., have been tried with favourable results. Vessels have been sheeted with glass instead of copper, with the most satisfactory results. With glass pulleys, especially for cable roads, friction is reduced to a minimum.

The Italian Consul-General has announced that a Government commercial museum has been established at Turin in connection with the industrial museum in that city, and that the authorities are desirous of receiving samples of produce or manufactures, with description and prices, for exhibition.

To preserve cord and rope from decay, immerse the cordage in a solution of 50 or 60 parts water and one part mercuric chloride (corrosive sublimate). This is said to preserve it from decay. We believe that standing rope is frequently treated with tar for a similar purpose, and an application of tallow is said to be beneficial for running rope.

M. Eitner proposes the following simple method of determining the value of leather employed on belting. A cutting of the material about .03 of an inch in thickness is placed in strong vinegar. If the leather has been thoroughly acted upon by the tannin, and is hence of good quality, it will remain, for months even, immersed without alteration, simply becoming a little darker in colour. But, on the contrary, if not well impregnated by the tannin, the fibre will quickly swell, and, after a short period, become transformed into a gelatinous mass.

A return is issued showing that in 1884 there were 99 cases under the Employers' Liability Act tried in the County Courts of England and Wales, the amount of compensation claimed being £30,845, and the amount awarded £8,882; seven cases were removed on application to the superior court, 76 cases were not tried, 35 were struck out, and 41 settled. In Scotland there were 147 cases tried, the amount claimed £34,553, and the amount awarded £2,127. In Ireland there were 42 cases tried, the amount claimed being £4,123, and the amount awarded £823.

Patents have been granted in France, England and Germany, and application for letters patent has been made in the United States, for an apparatus for a French system of manufacturing plush and velvet. By this system plush and velvet can be made either with the warp or with the filling; the plush or velvet is cut on the loom according to the measure of weaving; the apparatus can be attached to any loom; it is made in every width; it is adapted for silk, ramie, cotton or wool, &c.; plain or striped goods of any height of the nap can be woven, cut or uncut; chenille can be woven on looms which cut while weaving. The price is low, considering the great advantage of this apparatus.

### Sixpenny Telegrams.

The sixpenny telegram tariff, which came into operation on October 1st, introduces several changes in the method of writing and counting messages with which the public must become familiar before the advantage of the new tariff can be fully reaped. The receiver's name and address is charged for as part of the telegram, and the privilege of using an arbitrary name to represent the full name and address, on payment of a registration fee of one guinea per annum, will no doubt be extensively adopted by those who are in constant telegraphic communication. As a rule, a trade mark or some other distinctive word, should be used for this purpose rather than surnames, which are liable to cause confusion. The name and address of the sender need not be transmitted, but where it is required, it should be written at the foot of the form, in the same position as the signature to a letter. It will not be necessary to write the name of the town at which the message originates, as this appears on the delivery form. Messages may be written in Latin or in any modern European language. All words not forming a part of such languages, and unintelligible combinations of letters, are charged for at cipher rate, i.e. five letters to a word. Combinations of two or more words, which the usage of the language allows to be written together, such as fifty-five, Lieutenant-General, ironworks, are counted as one word. Names of towns and villages are counted as one word, as, for instance, Newcastle-on-Tyne, Burton-Salmon. The prefix St. forming part of the name of a town, will be reckoned as part of the word, thus—St. Albans. Names like McDonald, O'Neill, De la Rue are counted as one word. Initial capital letters, such as N. E. R., are counted as one word each. If written, however, in small letters—"ner"—they count has one word. The initials of the London Postal Districts are an exception, and count as one word for each set. Numbers expressed in figures, whether in the address or text, count at the rate of five figures to a word, thus, 7, 12, 38563, are one word. An additional word will be counted for the affixes to ordinary numbers, such as "st," "nd," "th," &c. The mark of division between numerator and denominator in fractions is reckoned as a figure. Thus  $12\frac{1}{2}$  is one word,  $10\frac{1}{4}$  is two words. The division between hours and minutes in groups of figures expressing time counts as a figure; for example, 12.35 is equal to one word; a.m. and p.m., when written thus, "am," "pm," count as one word only. When sums of money are written in figures, one word is added for each of the symbols £ s. d., thus, 7/6 is one word, 7s. 6d. four words; 2/7/6 one word, &c. Any instructions as to the forwarding of messages, such as "by post," "coach," or "by train," and such special instructions as "private," "confidential," to appear on the envelope, must be written at the end of the receiver's address, and will be charged for. The sender of a telegram can have copies of it delivered to several persons in the same town at the following rate: The total number of words in the text and addresses will be counted and charged for at the ordinary rate, and a charge of 2d. for every extra copy. Telegrams properly prepaid may be handed to rural postmen, or deposited in wall or pillar boxes, or letter boxes of ordinary receiving or sub-post offices, and they will be forwarded by wire immediately on arrival at the nearest telegraph office. The charge for portage outside the free delivery radius remains the same. Any person may register an abbreviated or arbitrary address on payment of £1 rs. a-year, dating from the day of registration. The address must consist of not less than two words, one of which must be town or place of delivery.



### Receiving Orders.

Carter, Harriet, Kiln End Mills, Elland, Yorkshire, woollen manufacturer.

### Adjudications of Bankruptcy.

Carter, Harriet, Kiln End Mills, Elland, Yorkshire, woollen manufacturer.  
Midgley, R. J., Lower Haugh House, Northowram, near Halifax, Yorkshire, worsted yarn finisher.  
Nathan, F. (trading as Frank Brothers), 51, Turner Street, Manchester, waterproof manufacturer.

### Dissolutions of Partnership.

Andrews, C. B., W. Burrowes, and G. B. Atkins, London, Manchester, Macclesfield, and Patricroft, silk manufacturers and merchants.  
Anyon, W., and W. H. Bradbury, 60A, Market Street, Manchester, manufacturers of Macramé lace looms and frames.  
Castlehouse, G., and D. Tolson, Earlsheaton, near Dewsbury, Yorkshire, shoddy manufacturers.  
Carter, W., and F. A. Ott, 1, Marsden Street, Manchester, silk merchants.  
Cockroft, A., and S. B. Robinson, Holme Mill, Halifax, Yorkshire, silk spinners.  
Haley, A., and F. Ripley, Spring Mill Street, Bradford, Yorkshire, worsted spinners and manufacturers.  
Knott, O., M. Knott, and R. Grundy, Grosvenor Mill, Ashton-under-Lyne, cotton spinners.  
Oscroft, W. D., and A. Fletcher, Nottingham, lace manufacturers.  
Stenson, G., and S. T. Parker, Long Eaton, Derbyshire, lace manufacturers.  
Shackleton, S., and G. Ainsworth, Bradford, Yorkshire, stuff manufacturers.

Thomas, J., R. Sutcliffe, and W. Thomas, Eastwood, Stansfield, Halifax, Yorkshire, cotton manufacturers.  
 Underwood, J., T. Green, R. J. Hardy, and J. Beardsley, 25, Stoney Street, Nottingham, lace manufacturers.  
 Winfield, J., and F. Swift, Orchard's Factory, Long Eaton, Derbyshire, lace manufacturers.

## PATENTS.

### Applications for Letters Patent.

Applying paint to textile fabrics, &c. A. M. F. Casper, London. 21st Sep. 11,216  
 Automatic cutter for looms when two or more widths are woven at one time. J. Whittaker, Hurst. 22nd Sep. 11,238  
 Actuating the pickers in looms. J. and E. Horrocks, London. 23rd Sep. 11,335  
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 Belt clamps and stretchers. J. Batley, London. 11th Sep. 10,784  
 Bobbins and spools. J. Bles, Manchester. 14th Sep. 10,850  
 Construction of machines for opening cotton, &c. G. Young, Manchester. 3rd Sep. 10,420  
 Clearing yarns or threads. E. L. Oliver and G. Andrew, Manchester. 4th Sep. 10,462  
 Construction of dobbies. W. Slater and J. Eckersley, Manchester. 5th Sep. 10,505  
 Construction of flat metal healds. J. Marshall, London. 5th Sep. 10,531  
 Card winding machines. T. Voile and T. Smith, London. 8th Sep. 10,629  
 Carpets, rugs, and other terry and cut pile fabrics. G. Marchetti, London. 10th Sep. 10,724  
 Cutting fabrics or webs into lengths. J. P. Robinson and D. R. Dawson, London. 10th Sep. 10,715  
 Cutting pile fabrics. J. J. Mann, Salford. 12th Sep. 10,799  
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 Clearer winding frames. T. Guest and T. Brookes, Manchester. 25th Sep. 11,424  
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 Dyeing black upon cotton, silk, or wool, or a combination in raw, hank or manufactured fabrics, producing a solid, clean and permanent black. C. J. Cox, London. 10th Sep. 10,723  
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### Patents Sealed.

3,752	9,678	11,731	11,952	12,119	5,550	6,234
11,785	12,059	12,230	12,258	12,273	12,402	11,588
12,033	12,135	12,365	15,125	17,013	2,467	6,592
6,607	12,403	12,660	6,469	12,229	6,553	6,922
6,923	7,069	7,094	12,800	12,861	12,919	15,621
681	922	7,219	7,228	12,630	12,636	13,211
15,598	3,964	5,462	7,266	7,353	7,392	12,719
13,901	14,126	7,004				



# The Journal of Fabrics

AND

## Textile Industries.

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### Notices.

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Authors are requested to retain copies of their manuscripts; rejected manuscripts cannot be returned.

To prevent any misunderstanding, all Articles sent to the *Journal of Fabrics and Textile Industries* for publication will be considered as offered *gratuitously*, unless it is stated explicitly that remuneration is expected.

Readers are invited to forward items of interest to the Trades concerned.

The Proprietors will feel greatly obliged if any of their readers, in making enquiries of, or opening accounts with, Advertisers in this paper, will kindly mention the *Journal of Fabrics and Textile Industries* as the source from whence they obtained their information.



### Broad-cloths.

[ By our Special Trade Commissioner. ]



AMONGST the changes that have taken place in recent years in what used to be considered formerly as the most "steady-going" departments of the textile trades there is none, perhaps, which offers such a striking example as that of the broad-cloth division, including in the aggregate coatings, trouserings, suitings, cloths for women's wear, &c., &c. Producers are frequently at a loss to account for the reason why, without any apparent adequate cause, the sale of certain makes of goods falls off, that used regularly to be called for; while the demand for others is augmented to an unaccountable degree; but, underlying these, there are influences at work which must inevitably produce these results, and as it is of vital importance to those concerned to fully understand the correct situation of any special branch of manufacture, I propose, upon the present occasion, to point out some of the causes which have affected the one which forms the title of the present subject, so that its position and prospects may be readily understood at the present time. Beginning with

cloths of a heavy make, the demand for presidents, naps, beavers, heavy diagonals, &c., &c., has been considerably less than usual during the last three or four years, (last year was somewhat better than its immediate predecessors) while no such great diminution has been noticeable in pilots. The reason is tolerably plain. A great many of the latter are consumed every year by sailors, large quantities of low goods especially being sold in the made-up form, as well as unmade for shipping, Holland alone getting through no small quantity in her sea-port towns, beside the usual home trade, while the ordinary top, or great coat, has not been in such regular demand in the latter. Cloths of a lighter kind as to weight have been made in ulsters, which, ugly as they are, have given way to more modified forms, such as coats with small capes of the "Newmarket" order, which the younger men now especially affect. Hence, there is a demand for goods suitable for garments of this character, to the prejudice of those of the older description, and manufacturers, in making their arrangements, must be guided by such facts. Although complaints are by no means rare in the cloth branch, of badness of trade, yet, there are at the present moment, a great many more cloths sold than ever there were, but there are also a great many more people in it. Vast quantities of cloths are now got through for women's use, especially in the shape of low-priced 50-inch goods, as Leeds meltons and Huddersfield tweeds. In the former, an immense improvement has taken place in the character of the stuff turned out, which is highly creditable to Yorkshire manufacturers, not only the finish being far superior to what it used to be, but the colours also; the blues, browns, olives, greens, &c., being all that could be desired by the most fastidious purchaser. Formerly, we used to import the bulk of light cloths for ladies' use from Belgium and Prussia, the bad colours of the English goods being against them. The low-priced Huddersfield tweeds, which have been turned out in such large quantities during the past six years or so, form another striking instance of an extensive branch of business springing up through adaptation of the material to a special purpose. Not only are these taken in considerable bulk for suitings, &c., but they now enter largely into consumption for women and children's wear. Makers, in the first instance, hit off capital imitations of the best Scotch tweeds, and they thought they had done their best. Some time back an outcry arose amongst consumers, which lasted for two years, for something different—for newer patterns. "What can be better than these patterns?" the makers would cry, pointing to close resemblances of the very newest Scotch tweeds, produced at half their price. Yet the want existed. The fact was, they were being taken up by women for jackets and mantles, and the neat styles adopted for men's suits were not always in accordance with the tastes of some women, and the introduction of a little more bright colour was needed. Accordingly a line of bright colour was introduced, either to form a check or stripe, or some other object, many of these being very bright, as red, deep amber, violet, or dark blue—colours that would not be at all appropriate in men's wear, though they were adapted for that of women and children. Here we have an instance of a latent want, or demand, that for the space of two years appeared not to be understood. The inference, or deduction, to be derived from this fact, is that a different order of colouring is needed by those who consume the goods in branches like mantle-making, to those "ready-made" houses that want stuff for men's and boys' suitings. Of late years an entirely new branch has sprung up in the cloth trade in the form of fancy worsted, and other coatings. These have been sold in considerable quantities by some makers. After this division had asserted a place for itself for two or three years duration, it was prognosticated that it would suddenly go out, and there would be an end of these cloths, and this opinion was widely spread. But it proved to be incorrect, for the demand still continued to the surprise of some of the most experienced people in the trade, and that they will continue to sell more or less for an indefinite period is now the common idea. An instance, on the other hand, of an old established make comparatively dying out, is found in that of the wide thin tweeds of Leeds make, generally known as "waterproof" tweeds. These used regularly to be sold in very large quantities every winter for women's cloaks, but they have been displaced by the newer fabrics which have been put upon the trade, and it is from such branches, of those engaged in the cloth line, that

complaints of the badness of business generally proceed. Many fresh makers have also entered into it. Since the falling off of the once considerable business done in bright-haired woollen and cotton goods in the form of mohairs, alpacas, sicilian cloths, &c., which had its home in Bradford, manufacturers have turned their attention, in this district, to the production of light weight twilled and other cloths, which have asserted a place for themselves in the market, many of these being suitable for the use of women as dresses. Cloth dresses of light weight are now much more commonly met with than formerly in general use by ladies, many of these being tailor-made. The consumption of cloth by women has thus largely increased of late, but then, there are a great many more people engaged in the trade than once was the case, and the putting of so many new fabrics into the market must necessarily displace some of the older ones, and, it may also be added, less meritorious fabrics. Each spring now sees large numbers of the melton jackets sold for the use of women, this cloth now having become quite a "standing dish," as it is called, in all the cloth houses. Formerly, the low-priced meltons were only to be had in that ugly, indescribable kind of grey that is vulgarly known as that of the workhouse hue. They were thick, clumsy, and hard; so hard that it was difficult to make them up, but by the judicious use of a small quantity of superior material, manufacturers, as before said, have improved the make vastly. It is a noteworthy fact, however, that a very large number of melton jackets for ladies are now imported from Berlin. The chief excellence of these consists of their superior making-up. They are tailor-made, and pressed well in the seams by a heavy iron which men alone can wield, and are finished off in a smarter, and more complete way than it is customary to find the case with English jackets of the same description, and it is a disagreeable circumstance to be obliged to chronicle that we in England, not unfrequently, lose business through the want of that care and attention to details that are given to them abroad by our foreign trade opponents. Speaking generally, it remains to be seen that, while old classes of goods are frequently displaced by new ones, it is by no means a work of difficulty, by even small departures, to create an interest in something fresh. One London cloth house advertises largely its "silk mixtures." There is nothing even very new about this, for just a fleck of white silk in Oxford-mixed trouserings has been known in the trade for many years. No matter. Create attention by drawing the notice of buyers to something a little out of the usual course, and the make becomes a speciality. The strong and tough qualities of silk are well known, and a few threads judiciously interspersed in the warp of any woollen fabric would doubtless give tenacity, and add a certain amount of durability to a fabric, while this fibre is elastic, and would accord with wool, and in fine counts may always be safely resorted to. The union of different fibres is not always a safe, or desirable operation. The results are often unsatisfactory, and they need judicious arrangement in their manipulation, as wet or damp will affect one and not the other, causing one to shrink and the other to remain intact, as in such an example as that of the "Japanese Silks," which sold so largely a few years ago. Consumers found that they would not stand getting wet, the result being they "cockled," as it is vulgarly termed, the surface acquiring a blistered appearance, which was very objectionable. In this case, however, as will be readily seen, there was a violent contrast, the entire warp being of silk, and the weft cotton; although even this combination may be resorted to with advantage, in the case of narrow goods such as ribbons, when a warp of white silk, with a cotton "shute" will give as good an appearance nearly, as an all-silk ribbon, both fibres being of the same shade of colour. In conclusion, I may add that, in despite of great competition and many recent changes, which are not as sufficiently well understood as they ought to be by many, the broad-cloth division, as a whole, is in a satisfactory position, when the generally restricted condition of the trade of the country is taken into account.

A coiled spring inserted between engine and machinery is highly beneficial where extreme regularity of power is required. It is well known that a steam engine, in order to govern itself, must run too fast; and too slow in order to close or open its valves, hence an irregularity of power is unavoidable.



## The American Power Loom.\*

BY ROBERTS BEAUMONT.



WEAVING, whether considered from an artistic or from a mechanical standpoint, is, unquestionably, one of the most important processes of cloth production. Other operations can only be said to be of secondary importance, having for their object either the preparation of the material for the loom, or the improvement of the appearance, handle and texture of the woven product. On the perfection of the productions of the loom depends, to a considerable extent, that of manufacture in general. Unless skill and experience are exercised in this operation, but little success, comparatively speaking, can be attained in the art of cloth making. The skill of the scribbler, and the careful workmanship of the spinner, in the production of good, sound, even yarn, would not result in the manufacture of saleable or attractive goods, providing the operations of the loom were in anywise defective. Such matters as these have, undoubtedly, weighed with both inventors and machine makers, and caused them to work in union with each other in the endeavour to produce a perfect loom. Whether they have yet succeeded can only be ascertained by an examination of the weaving machinery in present use, which certainly ranks amongst the finest and most improved of the factory. Even a casual analysis of the mechanism of the power-loom is enough to convince the observer of the completeness, symmetry and uniformity of its various parts. As a mechanical invention, we consider that it may be justly placed amongst the foremost productions of the human mind. When considering its mechanism, it should always be remembered that it is not merely a machine of one simple motion, but of a considerable number, working in harmony with each other, to attain one result, that of the weaving of a perfect piece of cloth. Those who are daily engaged in superintending its several motions are not generally the most likely persons to be particularly struck with the completeness and uniqueness of its construction. To them it would appear strange if this loom were not capable of forming the shed in the warp according to pattern or design; of propelling the shuttles in consecutive order across the piece; and of forcing the picks or shoots of weft one against the other; in short, of making the cloth and figuring it with design and colour to the idea of the designer, and, finally, of winding it on to the piece beam. All this, and much more, is expected of the modern power-loom; it should be replete with other motions of such a character that without any interference on the part of the weaver, providing the weft yarn is completed, or, in some machines, even if any breakages take place in the warp threads, the strap will be thrown off the driving pulley, and the loom brought to a stand-still. Without staying to notice what has been styled the "shuttleless loom," which may be regarded as a Utopian, if not a totally impracticable, piece of mechanism (unless constructed on the stockinette loom principle), described, nevertheless, in some papers as an American invention likely to revolutionise the whole system of weaving, we think that there is enough of the "wonderful" and "ingenious" about the mechanical contrivances of the power loom in every-day use to merit careful study. Perhaps no class of machinery is examined with such curiosity as this, and yet is so little understood by the common observer. He has been seen to stand, on more than one occasion, and watch the loom in operation for a considerable period of time, but only to appear more and more lost in the intricacy of its numerous working parts. There are, in fact, but few individuals who are able, without previous knowledge of weaving, to follow the routine of the motions of the loom; outsiders especially, or those entirely ignorant of textile manufacture, are invariably confused when they try to discover the analogy between the pattern in the cloth and the same on the lags, tappits, or cards. The questions and observations of these casual onlookers, in addition to being amusing in character, evidence how little they grasp of the actual construction of the machinery before them. One gentleman, for example, on seeing a long succession of lags, pegged and weaving a complicated pattern, remarked to the person who was for the time being acting as his informer, "I suppose, sir, you will be able to read the character of the design by running your eye over these wooden articles!" Another requested to know "how in the world a cloth was made by that wooden instrument"—meaning the shuttle—"running from side to side of the loom." Explanations to such individuals are comparatively useless; they generally turn away, politely expressing their thanks in the two remarkable words "how wonderful!" which would seem to imply that they are perfectly astonished at what their eyes have seen and their ears have heard, but also that they would require more time to master even the simplest motions of weaving machinery. Now, it must not be supposed that, in consequence of the uninitiated not being able to understand the construction of the power loom, it is unnecessarily intricate or complicated in build. It would, possibly, in some cases, be impracticable by simpler mechanical con-

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trivances than those already adopted to attain the required results. Of course, the loom has gradually developed to its present state of perfection. Its history has been one of continual improvement. When first invented, it was simply sought to produce a woven fabric by automatic appliances. Weaving capacity, shuttle box, and other motions, have all been after thoughts, the natural out-growth of the practical success of the former. To weave by power barely a century ago was, in itself, a wonder. The process was slow and imperfect, the loom possessing only one shuttle, and being heavy and ponderous, if not clumsy, in construction. Soon, however, the weaving power of the machine was enlarged; letting-off and setting up motions were improved, and box motion added, so that by stages the loom was supplied with all its present accessories. This accomplished, a cry was immediately raised for higher speed in the motive parts; in a word, for a fast or quick running loom. The loom manufacturer, in a measure, proved equal to the task, and met, with apparent promptitude, the demand of the times. Practical work showed, however, that the higher speeded looms were not so well adapted to the weaving of heavy as of light or medium goods. The consequences were that such machines made comparatively small progress amongst the makers of heavy fancy woollen and worsted fabrics. These manufacturers preferred to use the old loom, with its admitted slow motions and its perfect productions, rather than the new loom with its quick running and, perhaps, one-third as much again turn out, but with imperfect or damaged goods. Attempts were, therefore, made to improve the running face of the heavy looms, which were partly successful, although they did not warrant the machine being compared in this particular with the fast picking loom. The improvements served, however, all the purposes of manufacturers until a few years ago, when a loom appeared in the trade claiming to be constructed on an entirely new principle, and to be all that was required, as regards speed, mechanism, and figuring capacity. It is scarcely necessary to say that this machine was styled the American Power Loom, and was made by Hutchinson, Hollingworth, and Co. (Limited), Dobercross, Saddleworth. As a natural result this invention created considerable stir both amongst manufacturers and loom makers. Turners, weavers, and others interested in cloth production, discussed its capabilities, advantages, and disadvantages, and passed their various opinions upon it. These were so numerous and contradictory in character that we forbear to make any comment upon them. Nor do we consider that it comes within the sphere of this paper to predict what the future of the loom will be—we leave that portion of the subject to more competent judges—it is sufficient for the present to add that the firm who have introduced it into England, with many improvements and additions, at a very considerable expense, are satisfied with the reception it has met with thus far, and that only time and practical work will test its merits and prove whether it is to be ranked as one of the most useful looms in the trade. However, it may be added that when the variety of excellent looms that were in employment in the factory, previous to its being brought before the English manufacturer, are taken into consideration, it speaks somewhat in its favour that it has attained already what may be regarded as a standard position in the mills of some manufacturing localities. Further, the old description of loom was not only well established, but had done its work satisfactorily, and hence both employers and employees were somewhat indifferent about obtaining a machine so novel and different in construction from what they had been accustomed to. In fact, there are mill owners in certain clothing districts who refuse to look at any class of loom but such as they have employed for years. They cannot see the wisdom of making a change in the looms which have answered so well in the past; they are not to be persuaded to displace a machine which they have practically tested, for one, the capabilities of which they have only heard of; a rule which, if strictly adhered to, implies that they will not at any future time change their weaving machinery. In face of such formidable difficulties as these, the American loom must have failed to have gained a footing in English factories, unless in advance, in some respects, of the machinery then in use. Whether in favour of the invention before us or not, now that it is likely to be largely employed in both the woollen and worsted mills of this country, it is important that those interested in the operations of weaving, whether turners, designers, foremen, or manufacturers, should learn something of its construction, if they would keep abreast of the times. We purpose, therefore, discussing its construction, and also comparing its principal motions with those of the ordinary loom. Now every class of motion in the power loom is actuated, either directly or indirectly, by what is termed the main or crank shaft, on one end of which the driving pulley is generally fixed, but this is not the case in the American invention under consideration. Here motion is primarily given to the loom by a short stout shaft placed at right angles to the crank, connection with the latter being obtained by a pair of bevel wheels, the smaller of which is technically called the change wheel. The advantages of this mode of driving are said to be two-fold. I. Steadier, or more regularity in the motions of the loom. II. Its speed may be varied from 70 to 90 picks per minute without changing either the drum on the driving shaft, or the pulley on the loom, e.g. by simply employing a smaller or a larger change wheel according to the speed required, each tooth making a difference of five picks. Assuming that the crank shaft has been set in operation, it will be our object to trace the routine in which it transmits motion to the various parts of the loom, such, for example, as the shedding apparatus, the shuttle box motion, picking, letting-off and setting-up gearing. These,

as every practical man is well aware, are the main motions of every variety of loom, and, when understood, they furnish a fair idea of the complete mechanism of the machine, whatever the merits of its weaving capacity, or mechanical construction. We will, firstly, consider, therefore, the shedding arrangement, which is one of the most important in the loom, because it effects the production of the design in the woven cloth. The slightest defect in its mechanism will result in the weaving of a faulty piece of goods. Now, it forms, perhaps, one of the most noteworthy contrivances in the American loom, both in point of ingenuity and of simplicity. It is usually called the jacquard, but might more correctly be termed the dobbie, witch, or engine, and is fixed on one end of the loom. It is connected with the crank shaft by an upright lever placed on the outside of the loom frame, and communicates motion to the jacquard by several pairs of wheel gearing. In the arrangement of the levers, and, in fact, in the entire mechanism for lifting and sinking the healds, the invention is decidedly different from that applied to the generality of looms in use in this country. This will be evident by comparing it with that of the common English loom.

(To be continued.)

### The Ventilation and Sanitary Condition of Cotton Mills.

In order that the effect of heated atmospheres upon the lubricating properties of oils may be thoroughly understood, it is necessary to consider, generally, the properties of the oils mostly used in mills. It is within the memory of many who have still to do with the management of mills, when one kind of oil—fish oil, sold as sperm oil—was the only sort used for lubricating machinery, whilst animal oil was used for the lubrication of shafting. The acute competition of recent years has compelled manufacturers to find a substitute for the first, whilst experience, and the progress of science, have shown how the latter may be improved by admixture with other oils. Unfortunately, users of oil have not given the attention to the composition of the oils they use that the importance of this question demands, and have been generally content to try an oil which some glib-tongued oil salesman has persuaded them to be the “best in the market,” and have continued to use the same so long as no complaints have been made by those in the mill. It is not our intention to write an article upon oils, except so far as it may be necessary to show how the temperature in mills may affect them—the subject fully treated would occupy more room than we have at present at our disposal. The points that have to be examined in a good lubricating oil are:—

- High flash point;
- Chemical action on metals;
- Tendency to oxidise;
- Body, and, lastly, boiling point.

The first, viz., flash point, of course, is not materially affected by such changes of temperature as are usually found in mills. An oil that will not flash at under 350 degrees Fah., which is the limit for all good and safe oils, does not become of itself more dangerous at any of the higher temperatures found in a mill. The chemical action upon metals also is not influenced in any great degree by any of the variations of temperature, though buyers of oils should not neglect to see that the kind they use is free from any detrimental tendency in this respect. Oxidation—that is the tendency to absorb oxygen from the atmosphere—is really the first point we have seriously to consider. This constitutes one of the chief sources of trouble and danger in connection with the use of all vegetable and of some animal oils. This tendency is largely increased by the heated atmospheres of some rooms. As oxidation causes gumming, or clogging, this becomes a very serious matter. The tendency, however, to oxidise may be neutralised by the addition of mineral oil to the animal oil used. Mineral oil does not oxidise, but, in place of this defect, it has the fault of evaporating, which will be spoken of when we consider the boiling point of oils. The body of oils is really the important point in all oils, because, having obtained an oil perfect in respect to its flash point, chemical action upon metals, oxidation and boiling point, there would still remain this question—Has the oil the proper body suitable for the machinery it is required to lubricate? Should the body be too light a larger quantity of oil



must of necessity be used, but there is the danger that the additional quantity may not be given, then damage of the machinery and loss through extra friction ensue. Should the body be too heavy, the cost of the oil may easily be more than doubled by the increased consumption of engine fuel required in order to raise the extra steam necessary to turn the machinery. The best lubricating results are to be obtained by employing the thinnest-bodied oil which can be used consistently with the weight of the machinery and the temperature in which it works. If this be granted, and so far it is an uncontroverted fact, the importance of regularity of temperature becomes at once evident. But a mixture of oil, of a sufficiently thin body, cannot be obtained at a reasonable cost without using mineral or hydro-carbon oils. It is true that sperm oil is of a body sufficiently thin for most purposes, but the high cost, which would be enormously enhanced were all the machinery contained by the mills to be lubricated with it, puts its general use out of the question. This, however, would be simply impossible, as the supply could not half satisfy the demand. To shew the influence of heat upon the body of oils, we give the result of careful experiments made by an expert, which may be of interest

	Specific Gravity at 60° Fah.	Body in Seconds.	
		60° Fah.	120° Fah.
Animal oil	—	143	37
Olive oil	915	92	37
Sperm oil	880	47	30
Mineral	905	45	—
Do. Scotch	875	30	—

From the same series of tests, it was ascertained that the temperature developed by each oil through friction was in proportion or relation to its body, in the sense that the thicker the oil, the higher the temperature; consequently, as temperature is an equivalent of friction, and of an indication of the power necessary to overcome it, it is evident that an oil, suitable for its work when the temperature of a room is at its hottest, is most unsuitable and costly when the temperature is at that lower degree which is generally found to be most suitable for the operations carried on in the room. It is evident, also, that an oil should be used which has a body heavy enough for the highest temperature, as, otherwise, hot necks would soon demand a heavier oil, whereas the loss sustained by an oil with a too heavy body is probably only detected in the boiler house, and is generally laid upon the fireman or engineer. Cases have come to our knowledge which bear out our opinions in this matter. In a mill, spinning water twist upon the flyer frame, it was found that the engine could not be made to run the regulation speed when the temperature of the air in the throstle room was higher than a certain degree. In this case the steam engine power was only just sufficient to drive the mill under ordinary conditions. The owner at last was compelled to take means to keep the temperature of his throstle rooms constantly under a certain degree, and has not been troubled since by his engine running too slowly. Nothing, but an increased friction, could have caused his engines to be thus distressed. Boiling point is the last point we have to consider, and, under this head, evaporation and durability, which are intimately connected with, and regulated by, the boiling point. These mainly concern mineral oils, or those compound oils into which mineral oils largely enter. One of the chief differences between animal, or vegetable, oils, and mineral, or hydro-carbon, oils, is that, whilst exposure to the atmosphere in the former, tend, by the absorption of oxygen, to thicken and to gum, in the latter it causes the oil to evaporate more or less rapidly, and, sooner or later, to leave dry the surface upon which they are exposed. Of course, this defect in mineral oils varies in degree according to the quality of the oil, mineral oils of the highest grades being found to have this defect but to a slight degree. Mineral oils have been tested, which, when exposed for 12 hours to a temperature of 140° Fah., lost as much as 25 per cent. by evaporation. The two points, therefore, chiefly to be considered are the tendency to gum in animal oils, and the tendency to evaporate in mineral oils, but it is the latter point to which our attention should mainly be directed. The low price, and also the many good qualities possessed by a high-class mineral oil make it, in combination with only a small proportion of animal or vegetable oil, the favourite lubricant. The greater the proportion of the mineral present in the mixture and the less the oil costs. The

higher the highest temperature found in a room, the heavier bodied is the oil required to be, resulting in increased friction when the temperature lowers, and costing considerably more per gallon. On the other hand, for every degree of heightened temperature, there is the certainty that a loss results of so much more oil by evaporation, which can only result in so much more oil being required, or the far greater loss caused by the friction. We were lately privileged to hear some yarn doublers discussing some of the difficulties experienced in their business; one of the chief of these, in some quarters, seem to be caused by the contraction of the spindle bands during the night, but chiefly during the week end. This complaint was made by those who doubled by the wet doubling process. It seemed strange to us to hear practical men complaining so bitterly about such a matter, when the means of effecting a cure is always at hand, and at no extravagant cost. The difference in the temperature of many rooms between starting time in the morning and stopping time at night, is, perhaps, 10 per cent. to 15 per cent., or even 20 per cent. in the upper strata of the atmosphere in the room. The higher the temperature of the air, and the more moisture it will hold in suspension, this extra moisture is easily absorbed from the water contained in the troughs, and also from the water thrown on to the machinery and upon the floor during the process of doubling. During the night time, when the temperature is lowered, this moisture is deposited upon the windows and floors of the room, the spindle bands absorbing their share, the result being that the spindle bands contract, and, becoming too tight, so increase the friction of the frame, that it cannot be started with the engine, or, if started, causes great mischief to the spindles. If the temperature of the atmosphere near the ceiling was kept at one constant degree of heat during the day time, and if the temperature during the night time was kept at a higher degree than that during the day, we fancy the difficulty complained of would soon cease to exist. In these cases, we should recommend the steam pipes to be placed near the floor of the room, and not overhead, as is usually the case. To those who may desire to experiment in this matter, we would repeat that it is absolutely necessary, not only to regulate the heating of the room, but, also, to regulate the degree of humidity, and that, unless this be done, their experiments can only end in one thing, viz., failure. For a few shillings, a simple instrument called the hygrometre can be purchased, which will register the amount of moisture contained in the air.

### Novelties in the Textile Trades.



N the textile trades, novelties do not come out with that regularity which one might suppose possible. Is it that the scope allowed is not sufficiently large, or that manufacturers are too cautious to launch out with new ideas, fearing a loss in the operation? We think there is a little of the former, and a great amount of the latter reason brought to bear upon the question, whenever it engages the attention of those producing textile fabrics. We are led to this conclusion after a lengthened period of observation on this subject. Should one manufacturer, more gifted with a desire to produce that which is new, make an advance upon his brethren, he is left alone pending the result of his endeavours. Should he fail in his attempt, no one notices it, but should he succeed, the remainder immediately follow in his wake with a spirit worthy of originality. In other words, if one conceives a good idea and works it out to a successful issue, the rest of the manufacturing community immediately commence to make this fabric, and are not even particular whether or not they make it in a lower quality, and, therefore, at a lower price. Of course there are the patent and registration laws to protect any one, but at the same time there are things which may be novelties, but which could scarcely come under the protecting influence of these laws. We should like to see a different state of things. If each one was seized with a desire to introduce new features, instead of copying others, the result would be a large increase in the number of novelties, more beautiful fabrics would be introduced, and probably

### An Increase of Business would Result.

It may, however, be urged that, for some time past, the condition of trade has not been, and is not now, favourable to the introduc-



tion of new features, which would necessitate an increased expenditure. This may be so, but the question arises whether this increase would not serve to give an impetus to the slowness of the markets, and thus bring a return of the expenditure with the addition of a reasonable profit. There is money waiting for the firm who can bring out a new cloth, but it must be really new. No touching upon old ground, no resemblance to other things which have been, or are now, worn. These thoughts bring to our remembrance a little matter which occurred some years ago in a factory in this country. An order had been given for a lot of goods, and these were begun in the looms. The master, in passing through the weaving shed one day, chanced to notice at one of the looms a piece of cloth which struck him as peculiar. It took but little time to see that a glaring mistake had been made, the surface of the cloth assuming a novel appearance. Inquiries were instituted as to the mistake, and the various processes through which the material being used had passed, and the result was that another piece was woven like the first, and submitted to merchants, who placed large orders for the cloth, and eventually it became very popular. Here was a new cloth produced, but as the result of a mistake. But, to resume. We have often stated that

#### The Future would only Favour Novelty.

and the facts that face us every day leave undoubted evidence of the truth of our assertions. But here let it be understood that we take the word "novelty" in its strictest meaning—that which is perfectly new. It is only upon conditions of novelty that manufacturers may hope to receive good orders, and to sell their productions at remunerative prices. It is difficult, we know, for every manufacturer to produce something original—a real novelty—in all the signification of the word, but we are fully convinced that safety lies in this only. We wish, therefore, to specially impress upon our numerous readers the necessity of introducing new fabrics, and of imparting originality to all their productions, and every effort must be made in order to succeed. As one means towards obtaining the results here named, it would be well for every manufacturer to employ a good designer, a man of talent, well up in all the varied routine of his business. The extra salary paid to a man of this character is more than returned to the employer by the superiority of the class of designs and fabrics that he originates, and which, undoubtedly, bring more grist to the mill. Many of the fancy novelties in cloth goods now before the public are of superior quality, well set up, rich in colour, and in perfect good taste. Such specialities may be quoted at a higher figure, according to their elegance and cost of production, than goods of a lower degree of merit. They are, moreover, freer from the generally keen competition to which inferior articles are subjected, and consequently must leave the market more profit; therefore, as we understand novelty, it opens the most profitable path alike for the present as for the future, a path otherwise so difficult to tread in these days of keen competition. It is wiser to aim at a small production of novelties than at a larger output of ordinary goods, which the million are tired of looking at. At present, the most welcome cloths for gentlemen's wear are those produced with a mixture of silks of the following colours—white, orange, red, blue, and light green, these colours being worked into trouserings, coatings, and even into overcoatings, in checks, stripes, and also on plain grounds. Everywhere

#### A New Cloth is being Asked for

to supplant the plain cloths, such as meltons, beavers, moscovos, and pilots, which the public are tired of. At this season of the year, a novelty in an overcoating would be very acceptable. Some have asked for the nap cloth, but we do not think the present an opportune time for the re-appearance of this fabric. Many manufacturers have come forward with rare and beautiful articles produced from the kyle, the knot, and the spiral yarns. We brought these novelties to the notice of our readers some months ago by the aid of information obtained from confidential sources. As we intimated in our last issue, our expectations concerning them have been more than realised. The Soleil and Ottoman mantle cloths are still in very great demand, and, judging by the designs lately produced, we venture to predict a good season to come. The Soleils are also produced in combination with figured designs, in which the kyle, knot and spiral yarns play a very conspicuous part. Our purpose in continuing this article is to make suggestions for new departures in the making of various fabrics. There

is a good opening at the present time, for those who care to launch out a little, for the making of backed lenos—a first rate material for ladies' mantle cloths. The expense involved would be slight, and we have good grounds for supposing that the outlay would soon be returned.

#### The Subject of Backed Lenos

is one with which very few are familiar, therefore, we hope to be able to give satisfactory replies to inquiries which may be addressed to us. It appears that in the making of all classes of window curtains a very effective change could be adopted, and one which, we think, would be likely to take in the market. Hitherto curtains have consisted of a body or filling, usually of an all-over effect, with a border running down each side and along the bottom, with, sometimes, a dado in place of the bottom border. In this arrangement no alteration is ever made. We would, therefore, suggest, as a pleasing change, the introduction of a frieze across the top of each curtain of, say, twelve inches in depth, with four or five inches of plain material to allow of hanging without any interference with the pattern of the frieze, and that it may be fully displayed below the cornice, should one be used. This arrangement of a curtain would only be a question of a little more designing and cutting of cards. A good effect might be produced by introducing kyle yarn in the manufacture of curtains or piece goods for decorative purposes. We have before alluded to the great variety of goods now upon the market in which kyle yarn is employed. There is no reason why this yarn should not be used as above suggested. In the hands of the skilful designer, patterns might be easily produced with the kyle in either ground work or ornamentation.

#### For Tapestry Fabrics,

we specially commend this material. Whilst upon this subject, we may mention an invention of a curtain which has lately been patented, and which we will briefly describe. A pair of curtains are woven—side by side—in one piece, and are then cut up the centre, leaving a portion, top and bottom, uncut as woven, i.e., joined. In hanging the curtains, they require to be looped back in the centre with a band or chain which draws them apart. In looking around, it appears to us that there is a variety of fabrics into the manufacture of which some changes might be introduced. Take the linen trade as an instance. In linen damasks for the table, the rule is to make every description of these goods in white or unbleached linen, according to the quality of the article being made. There is certainly a delicacy in the appearance of a white cloth for the dining table, but if faint shades of colour were used in conjunction with a white ground, the effect would be equally good. The colours used, such as a pale blue or pink—we should not use more than two upon the white, and none of a heavy shade—might be either printed or woven in an all-over running pattern. And here a thought arises as to whether such a pattern could not be woven in the white, and touches of colour printed here and there upon the pattern, but the difficulty of accurately printing upon it seems to us to be great, still we think the suggestion is worthy the attention of linen manufacturers. In linen handkerchiefs, a good effect might be produced by printing, in pale, delicate shades, elaborate patterns in the centre, with just the slightest indication of a border. These patterns would be best if of a geometrical tendency, and of a style known by some manufacturers as jewels. If these goods were produced in a high class style, we think they would take a prominent place in the market. There is another kind of fabric which is just now engaging the attention of manufacturers of dress goods. We allude to leno (single, not the backed leno mentioned above), which is capable of being used for a variety of purposes. For window curtains, antimacassars, bed hangings, counterpanes, and such goods, either in white or colours, there is nothing more suitable. The material should be made in a coarse sett, and when hung against, or placed over a bright shade of some other fabric, the effect is very pleasing. A good leno may be produced by using 2/16's warp, and 10's weft, in a 20's sett.

A telegraphic code, framed to make the sixpenny telegrams as widely useful as possible, has made its appearance. Mr. Curcio, of Catherine Street, the publisher, claims for it that it will increase the value of the sixpenny telegram from fifty to five hundred per cent. However this may be, the code contains about a thousand every-day messages represented by words of five letters.



## ORIGINAL DESIGNS.

The design on our first plate is the work of Mr. R. T. Lord, 97, Park Road, Bradford. It is intended for a Tapestry Fabric, but is equally suitable for Cretonnes.

On our second plate we give an imitation Leno pattern, particulars of which will be found on page 55.

Our third plate contains a design for a Border for a Curtain, and might be used along with the design on plate one. It is adapted for a Lace Pattern, also for Felt for Printing, &c., &c. This is also the work of Mr. R. T. Lord.

## TO MANUFACTURERS AND DESIGNERS OF CLOTH.

The latest patterns of French and English Coatings, Vestings, Suitings, Fancy Cloths, Cassimeres, Tweeds, Mantle Cloths, &c. These Patterns give the latest Designs and Colourings for Cloths, for Autumn and Winter, 1886.

## 100 SAMPLES FOR £2. CARRIAGE PAID.

A remittance must accompany order, made payable to H. and R. T. Lord, the "Journal of Fabrics and Textile Industries." Office, 10, Ann Place, Bradford, England.

Those of our readers who are interested in the subject of Designing should see the Japanese Art Book, Japanese Design Book, and Encyclopædia of Design, particulars of which will be found on our fourth advertisement page.



## MONTHLY TRADE REPORTS.

**Wool.**—A rather better feeling has characterised the markets during the past month, although the quantity of wools passing into consumption has not been of much greater volume than usual. The finer qualities have been most inquired for, and have, consequently, been stiffer in price. In Botany wools a fair business has passed, and prices have remained firm in the face of the large quantities at present in the market. The yarn trade has kept spinners fully engaged, as a rule, on old orders, and new ones are offered fairly well. The margin for profit has increased slightly in some sorts, especially for special fancy yarns. The piece branch has not altered to any appreciable degree. There has been more inquiry for the American markets, but without much actual business resulting. In fancy looped cloths there has been more business done at slightly improved rates.

**Cotton.**—The demand for the raw material has continued slow, hardly any improvement being experienced since the close of the Oldham strike. In yarns, trade has been dull, and prices have given way, the demand having been inconsiderable. Export yarns have not met with any improvement, and buyers, hoping that prices will fall still lower, are holding off until they can accurately gauge the markets. In the cloth branch, although such a large number of looms are idle, the supply still more than equals the demand, and, as a consequence, prices are affected. There seems but little prospect of a general running of looms during the winter, at the unremunerative prices now prevalent.

**Woollen.**—The demand for this class of textiles has been fairly good, and manufacturers of the better and medium classes of worsteds, fancy tweeds and choice fabrics for ladies' wear, have secured orders to last them for some time to come. This applies to both the home and foreign demand. In the Yorkshire districts of Leeds and Huddersfield, full time is the rule, as far as looms are concerned, with the exception of those engaged on the plain classes of heavy goods. This branch seems to be the least satisfactory. In the Scotch districts, manufacturers of chevots and tweeds are fairly employed on fancy cloths of varied designs and colourings. Prices are generally firm, although merchants are very chary of giving any advance.

**Linen.**—This branch has shown no signs of improvement, but manufacturers are hopeful of a demand for America springing up shortly. In the jute trade, more activity has been displayed both in the raw material and in the manufactured article, and there are signs of a permanent improvement. Prices for jute goods have advanced slightly in sympathy with a rise in the raw material, but the linen branch has not exhibited any material difference.

**Lace.**—There is nothing new to report regarding the lace trade. It keeps in the same languid condition that has characterised it for some time past. Manufacturers were in hopes of doing a fair business with American houses recently, but the sales have been below their expectations. The demand, both for home and foreign account, has been of an indifferent description, and such as to dishearten manufacturers generally. Prices, on the whole, are unremunerative.

## The German Tariff.

The London *Economist* abstracts from a blue book just issued the text of the German customs tariff as recently amended. The following is a list of all the textile articles and oils, the duties upon which have been altered. On such articles, not included in this list, the duties remain as before:—

Description.	Old.		DUTIES PER CWT. New.	
	£	s. d.	£	s. d.
Lace and embroidery.....	6	7 0	8	17 10
Emery cloth .....	Free		0	3 0 3
Ultramarine .....	Free		0	7 7 1/2
Pasteboard and paper made of asbestos—unshaped.	Free		0	5 1
Shaped and perforated .....	Free		0	12 2
Yarns, ropes, &c., of asbestos combined with other material .....	Free		0	12 2
Asbestos web combined with other material .....	Free		1	0 4
All other asbestos goods not included under No. 20	Free		1	10 6
Silk, floss-silk, with metal threads, embroidery, or lace	22	17 3	30	9 8
Of half silk .....	11	8 7 1/2	17	2 10 1/2
Artificial flowers, complete .....	7	12 5	22	17 3
Do parts of .....	3	1 0	22	17 3
Yarn, not dyed, printed, or bleached; similar yarns of jute or manilla hemp—				
Up to No. 5 English .....	0	1 6 1/2	0	2 6
Over No. 5 English and up to No. 8 .....	0	2 6	0	2 6
Sewing thread .....	0	18 3	1	15 6
Ropemakers' wares, not bleached or tarred .....	0	3 0 1/2	0	5 1
Damask of all kinds .....	3	0 11	3	16 2 1/2
Embroidery .....	2	10 10	3	16 2 1/2
Thread lace .....	15	4 10	20	6 4
Mineral lubricating oils .....	0	3 0 1/2	0	5 1
Thread, from raw silk, dyed or not dyed .....	2	10 10	5	1 8
Stuffs manufactured out of silk or floss silk, in combination with metal thread; silk stuffs mixed with other materials, and combined with metal thread..	15	4 10	15	4 10
Lace, blonde and embroidery, entirely or partly of silk .....	15	4 10	25	8 1
All silk or floss silk goods not specified in preceding class, mixed with cotton, linen, wool or other animal or vegetable materials .....	7	12 5	11	8 7 1/2

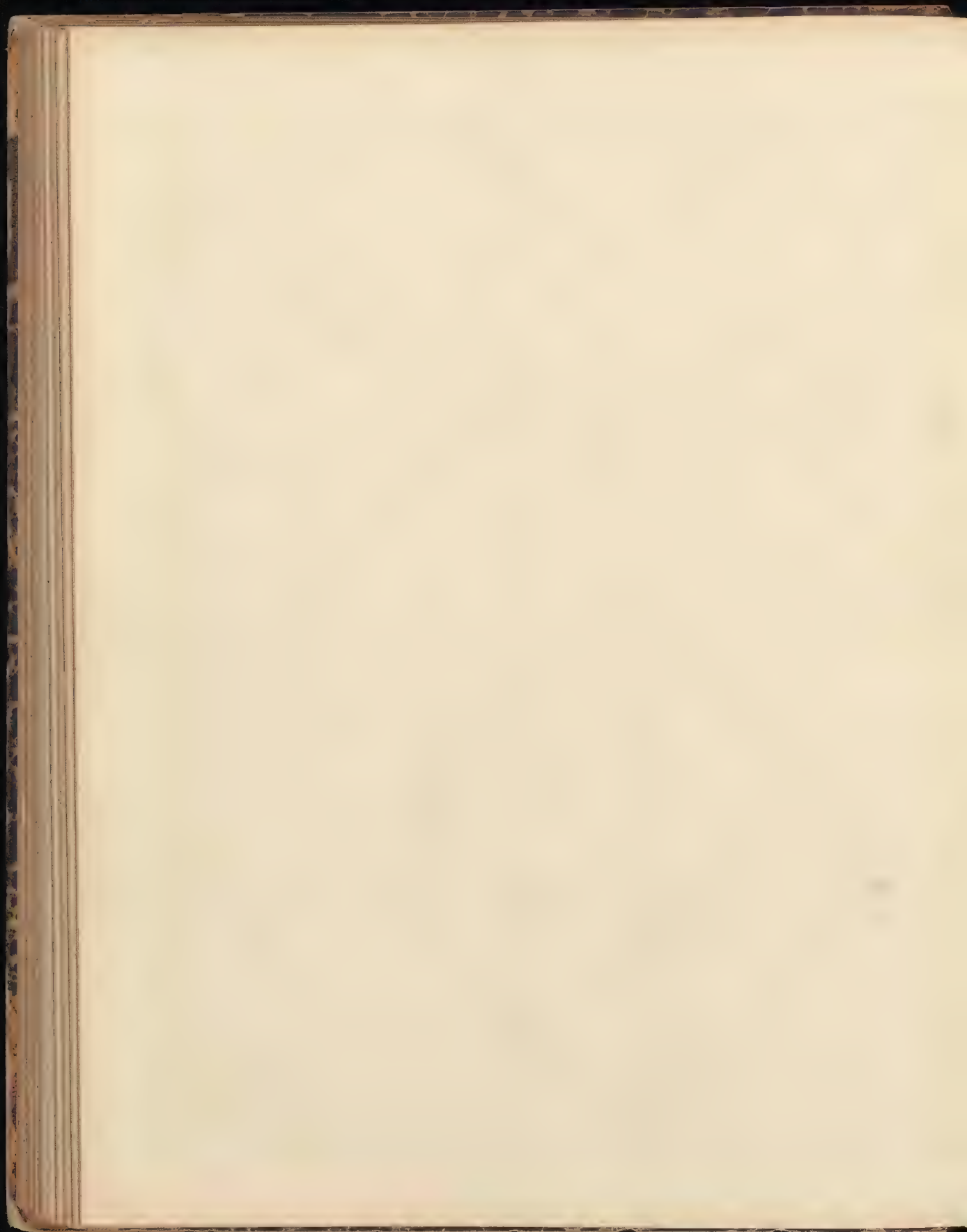
\* The Bundesrath is authorised to admit duty free all mineral oils intended for other purposes than lighting, under control. The Bundesrath is also authorised to charge duty by barrel, taking a maximum weight of the ordinary barrels of commerce.

An American textile journal gives the following advice to manufacturers:—"Look well to the bearings of your shafting, engines, and machines. Sometimes twenty-five, thirty, forty, and even fifty per cent. of your power is consumed through lack of good oil. For leading steam joints, mix the red lead or litharge with common commercial glycerine, instead of linseed oil.—Put a little carbolic acid in your glue or paste pot. It will keep the contents sweet for a long time."





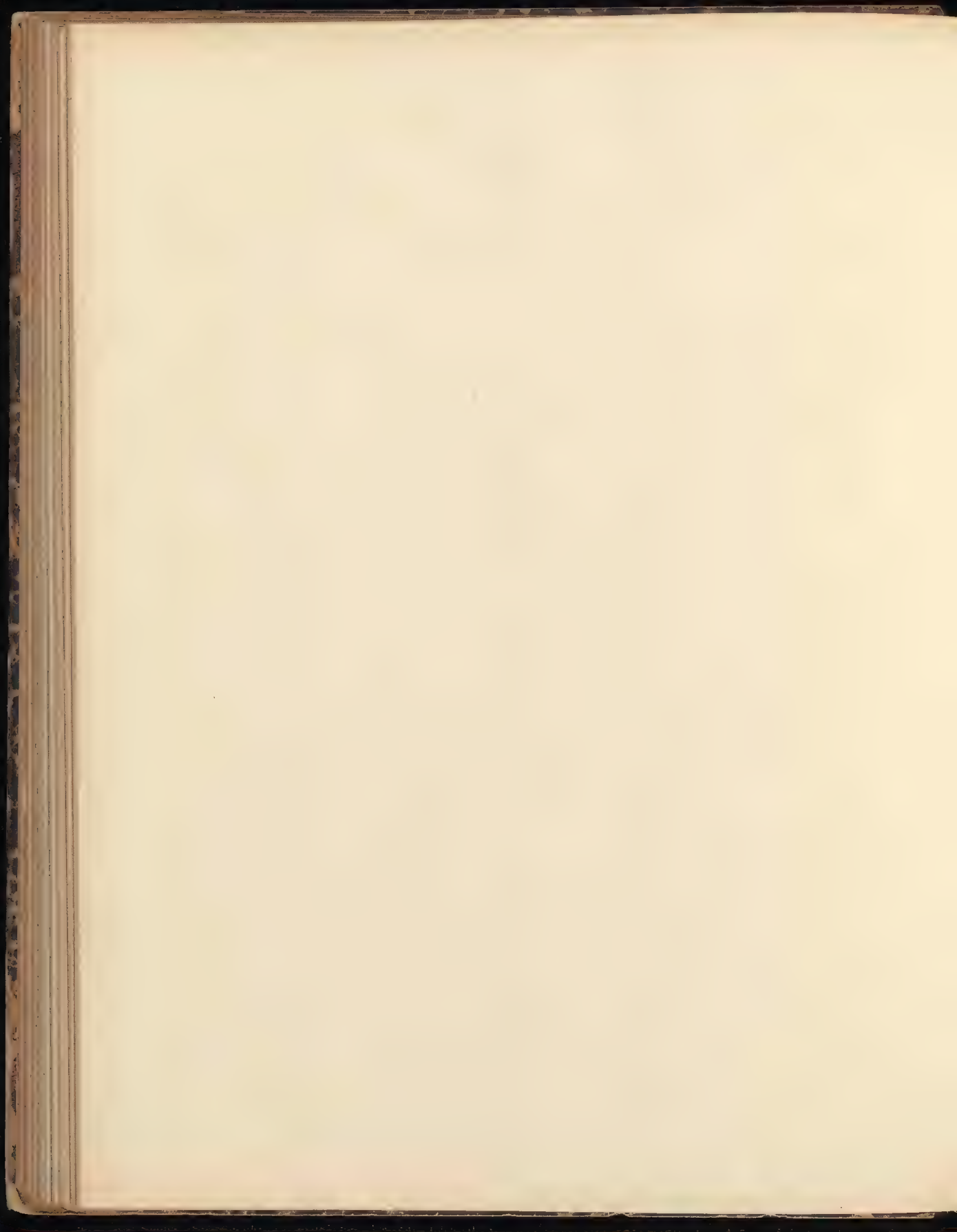
TAPETRY FABRIC.







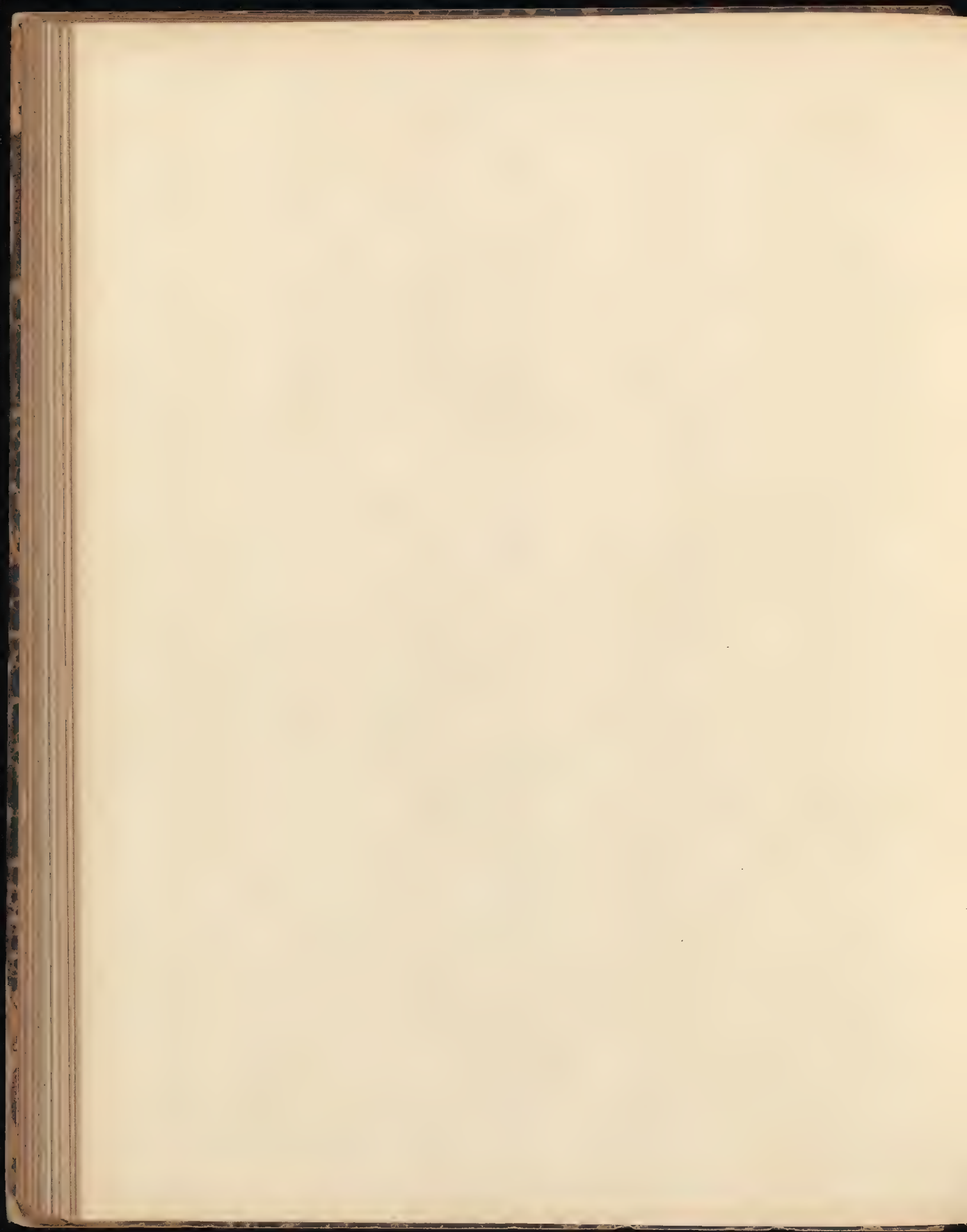
DESIGN FOR IMITATION LENO.







BORDER DESIGN.

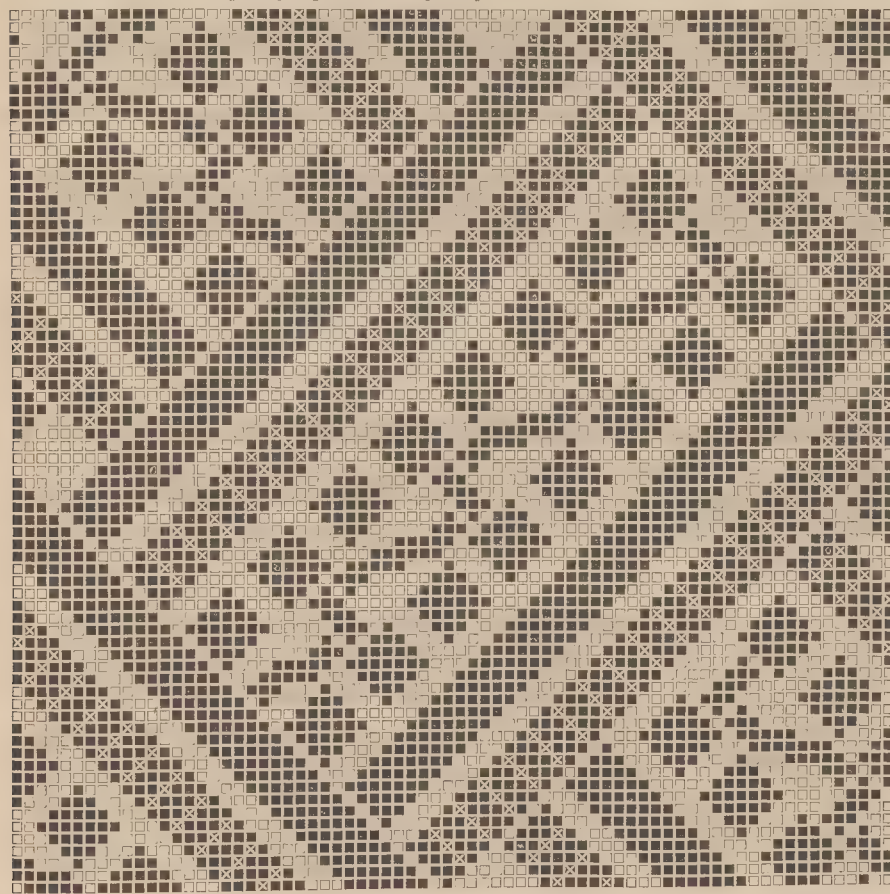






## Design for Dress Goods.

The design No. 312 is for dress goods, and should be produced as follows:—Cotton warp 1/50's, and 32's lustre or coloured weft, 60's sett, 15 picks per quarter, or 60 picks per inch.



Design No. 312.

## Fancy Suiting.

No. 313.

Warp:

1 Knickerbocker Blue, Black and Scarlet.  
 1 Black and Tan.  
 1 Knickerbocker Blue, Black and Scarlet.  
 1 Black and Tan.  
 1 Black and Brown.  
 1 Black and Tan.

Design.

33 ends per inch.

34 to 36 picks per inch.

11's reed.

3 ends in each split.

66 inches wide in the loom.

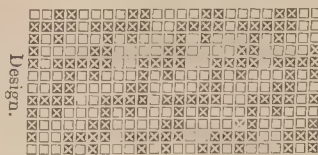
56 " " when finished.

6 threads.

Weft: All Black.

All to be 16 skeins.

## Superfine Coating or Suiting.



60 ends per inch.  
 64 picks " "  
 15's reed. "  
 4 threads in a split.  
 66 inches wide in loom.  
 56 inches clear finish

Warp and Weft for No. 314.

3 Black.  
 1 Black and Pale Blue.  
 1 Black.  
 1 Black and Pale Blue.  
 5 Black.  
 2 Black and White.  
 5 Black.  
 1 Black and Pale Blue.  
 1 Black.  
 1 Black and Orange.  
 5 Black.  
 1 Black and White.  
 6 Black.  
 1 Black and Pale Blue.  
 1 Black.  
 1 Black and Pale Blue.  
 5 Black.  
 2 Black and White.  
 4 Black.  
 2 Black and Pale Blue.  
 1 Black.  
 1 Black and Orange.  
 5 Black.  
 2 Black and White.  
 7 Black.  
 2 Black and Pale Blue.  
 1 Black.  
 1 Black and Pale Blue.  
 5 Black.  
 2 Black and White.  
 1 Black.  
 1 Black and White.  
 5 Black.  
 2 Black and Pale Blue.  
 1 Black.  
 1 Black and Orange.  
 5 Black.  
 2 Black and White.  
 2 Black.

96 ends and picks.

Warp and weft 30 skeins.

2-fold 60 skeins twist.

## Mantle Cloth.

Warp and Weft:

1 Loop 2's mohair or knotted yarn.  
 5 Grey 16 skeins twist woollen.

6 ends.

For piece dye.

30 ends per inch.

30 picks " "

10's reed.

68 inches wide in loom.

3 ends in each split.

54 inches wide when finished.

## Imitation Leno.

On our second separate plate we give a design for Imitation Leno, No. 316. The particulars are as follow: Cotton warp 1/50's, and 52's weft, 60's sett, 15 picks per quarter, or 60 picks per inch. Plain bottom ground, but all dots, miss blacks.





## MACHINERY, TOOLS, &C.

### New Patent Shuttle Pike.

Amongst the various improvements which have recently formed the subject of patents is one which appears to us worthy of mention in these pages. The invention is that of a shuttle (which is being largely used in the woollen districts, and is also adaptable to other districts), the pike of which is made upon an entirely new principle. Of course, the principle upon which the shuttle pikes generally in use are constructed is well known to all those interested in looms,—how the pike is fixed in the shuttle, how a spring is fixed, the length of the pike, and how there is a hook-like projection at the end, over which the bobbins or spools pass on being placed upon, or taken off, the pike; this causes much damage to, and ultimately renders the former worthless. In the construction of the shuttle pike under notice, a totally different method is employed. It takes the form of a simple bar of metal, having a button at the end in place of the projection above mentioned, and, when requiring to place a bobbin or spool upon the pike, the latter is entirely removed from the shuttle. In the end of the shuttle is fixed a small metal box, the inside of which is so shaped that the end of the pike fits tightly and firmly into it, and, to prevent it slipping forward, a strong peg upon the bottom of the box fits into a corresponding orifice in the pike. The lid of the box closes with a firm spring, then the shuttle is ready for use. To remove the pike, it is only necessary to raise it in the usual way, when the lid opens, and the pike is free. The weaver will find that it can be used as easily and as quickly as the old pike, and, moreover, it is so strongly constructed that it is impossible to get displaced without using the pike as a lever in opening the spring lid. The invention has been patented by Mr. Thomas Webster, of Commercial Shuttle Works, Commercial Street, Morley, near Leeds, to whom application should be made for further information relating to it.

### Shuttle Guards.

The frequency of accidents to weavers from shuttles flying from the shuttle races of looms has for some time past claimed the attention of manufacturers and others engaged in the textile trades, with the result that numerous shuttle guards have been invented. We have lately inspected one of these which has been patented by Mr. Fred. Waterhouse, of the firm of Messrs. Jonas Waterhouse and Sons, Globe Works, City Road, Bradford. The principal feature of the guard is a narrow rail, the length of, and attached to, the hand rail, by means of right-angular arms. This bar moves in a horizontal position from the hand-rail and is worked from both ends of the loom. When the loom stops, the bar slides under the hand rail, so that the weaver has a full view of the fabric and free access to the reed. By the starting of the loom, the rod on the hand-rail acts on two bell crank levers at opposite ends of the loom, and these being connected by pins to the slides, to which the guard is fixed, force them out, the stopping of the loom reversing the motion, and not leaving it to come back by its own weight. There is no uncoupling of any part of the guard when parts of the loom are required to be uncoupled. If, as the inventor says, a warp is to be slayed over in the loom, the hand-rail is unfastened as usual, and the parts of the guard on it come away with it, and return to their proper position when the hand-rail is replaced. The same occurs to other parts of the guard when moving any parts of the loom to which they are fixed. There is nothing clumsy about this shuttle guard, on the contrary, it is as neat a piece of mechanism as we have seen. It can be applied to either fast or loose reed, or to deep or circular box looms of any width. All those interested in the subject will be able to see the guard in operation by calling at the address above named.

### Means for Extinguishing Fire.

From "The Journal of the Franklin Institute," by C. JOHN HEXAMER.



BEFORE we can enter into a discussion and description of how to command the phenomena of combustion, we must understand a few preliminary facts. If we rapidly draw our hand through the surrounding space, we feel a certain amount of resistance. This resistance is due to a gaseous body which surrounds us on all sides, and which we term air, a substance known to the ancients, who tried to weigh it. Aristotle, for example, filled a bladder, and weighed it, then exhausted the air and reweighed the bladder, and actually believed he had thereby determined the weight of the atmosphere. It was not, however, until the advent of the experimental era under Galileo and Torricelli that its weight or pressure was determined. It was found at the level of the sea, to be about fifteen pounds to the square inch. This surrounding fluid consists of two gasses, oxygen and nitrogen; not, however, chemically combined, but merely mixed in the proportion—in round numbers—of seventy-nine parts of nitrogen, and twenty-one of oxygen. Nitrogen, which is fourteen times heavier (atomic weight) than

hydrogen, is a gas entirely negative in its qualities; it does not support combustion, and its purpose in the air is merely to act as a diluting agent so as to make the effects of oxygen less active. Oxygen, the great supporter of life, and also the great destroyer in nature, is an odourless, colourless gas, sixteen times (15.95 atomic weight) as heavy as hydrogen. It and its combinations constitute the greater part of our earth. The so-called crystalline rocks which consist largely of silicates, contain from forty-four to forty-eight per cent. of oxygen. Water, which is a compound of oxygen and hydrogen, contains one part by weight of hydrogen to eight of oxygen. It is this element which causes all those phenomena which we ordinarily term combustion. Phenomena which it causes while ordinarily diluted with nitrogen (air) are greatly intensified when the element is pure; and even metals, such as iron and steel, when ignited in a globe filled with oxygen, burn with brilliant scintillations. We are now ready for the question, "What is combustion?" I would define it as a chemical union of oxygen with some other element or elements, accompanied by an evolution of light and heat, while similar unions of other substances, not with oxygen directly, I will term "chemical combination." Substances which unite with oxygen are termed combustible substances, while oxygen is a supporter of combustion. These terms, although but relatively correct,—as combustion might be defined as an act of a chemical union accompanied by an evolution of light and heat—are for our purposes very convenient, and will be retained throughout. We must, before entering into the subject under discussion, understand what is meant by the temperature of ignition, or the ignition point. It has been found that before a substance can ignite (take fire) either in the air or oxygen, a certain temperature must be reached, and this necessary temperature is termed the ignition point or temperature of ignition. While for some substances this point is very low, for others it is extremely high; for example, nitrogen will only unite with oxygen at the intense heat of the electric spark; while phosphorus burns slowly at 10°C. (50°F.), as may be noticed in the dark (phosphorescence), it does not burn brightly until heated to 60°C. (140°F.), and zinc ethyl and phosphuretted hydrogen ignite in the air at the ordinary temperature. But most bodies do not unite with the oxygen of the air rapidly enough at ordinary temperatures to produce light and heat, but must be heated for a production of active combustion. In the case of the decay of organic matter, or the rusting of metals, oxidation goes on slowly, producing heat, and the total amount of heat that a decaying log produces in the long time required for its destruction is exactly equal to the amount of heat produced by its rapid oxidation (burning) in a stove. We, therefore, distinguish between quick and slow combustion. The temperatures of different flames vary greatly. Bunsen found that the temperature of the flame of hydrogen burning in air is 2,024°C., temperature of a hydrogen flame burning in oxygen 2,841°C., carbonic oxide 1,897° when burning in air, and 3,003°C. when burning in oxygen. In order to measure the quantity or strength of a material or force, we must have a measure or standard of comparison. The standard for the measurement of heat, if the expression be allowed, as heat is a force and not a material, is the "thermal unit," the amount of heat required to raise the temperature of one cubic centimetre of water one degree Centigrade. This measure is now almost universally employed by scientists, although the old English caloric unit, the amount of heat required to raise one pound of water one degree Fahrenheit, is still sometimes employed. Two other units are also used; in Germany, the amount of heat required to raise one kilogramme of water one degree Centigrade is much used; while the unit of one pound of water to one degree Centigrade is sometimes employed.

COMBUSTION IN OXYGEN.			
One gramme of	Thermal units.	Observer.	
Charcoal	7,273	.....	Lavoisier.
"	7,167	.....	Dulong.
"	7,912	.....	Depretz.
"	7,714	.....	Grassi.
"	8,080	.....	Favre and Silbermann.
"	7,900	.....	Andrews.
Diamond	7,770	.....	Favre and Silbermann.
Natural graphite	7,811	.....	"
Gas carbon	8,047	.....	"
Hydrogen	34,462	.....	"
"	33,808	.....	Andrews.
"	34,180	.....	Thomsen.
Sulphur	2,220	.....	Favre and Silbermann.
"	2,307	.....	Andrews.
Phosphorus	5,747	.....	"
Zinc	1,801	.....	"
Iron	1,576	.....	"
Tin	1,233	.....	"
Copper	602	.....	"
Marsh gas	13,063	.....	Favre and Silbermann.
"	13,108	.....	Andrews.
"	13,120	.....	Thomsen.
Olefiant gas	11,858	.....	Favre and Silbermann.
"	11,942	.....	Andrews.
"	11,957	.....	Thomsen.
Carbon monoxide	2,431	.....	Andrews.
"	2,403	.....	Favre and Silbermann.
"	2,385	.....	Thomsen.



Numerous experiments, made by different scientists, have proved beyond a doubt that a constant quantity of heat is given off when the same weight of the same substance burns to form the same products of combustion, whether the combustion proceeds slowly or rapidly. Numerous measurements of the amount of heat disengaged by the combination of different substances with oxygen have been made, of which those of Andrews, Favre, Julius Thomsen, and Silberman are the most correct. The above table, compiled by Roscoe, shows the heat of combustion in thermal units for one gramme of substance burnt.

**WATER.**—Water was the first material employed to extinguish fire. One of the best materials and means for extinguishing fire are well-filled galvanized iron water-buckets. These should have conical bottoms, so that they can not be used for other purposes than that for which they are intended. They should be kept filled at all times. A very good method of keeping them filled is to appoint a special man for this purpose, and fine him one dollar for every bucket which is found empty. It should be the particular duty of the watchman to examine the buckets daily and report on their condition; and, in order to increase his surveillance, the money obtained for fines should be presented to the watchman, whose vigilance in this respect will thereby be greatly increased. Reliable automatic devices are always preferable to means depending on human agency, and for this purpose the "automatic electric low water alarm" is highly recommended; this is a device which sets an electric bell in the superintendent's office into operation as soon as one quarter of the contents of a bucket evaporates, and continues to ring until the bucket is filled. Buckets should be of iron, not wood, as wooden buckets, when they are dry or partially empty, shrink and become leaky. They should be well covered, first, with a zinc coating, which is generally called galvanizing, and then with good tar or asphaltum paint, put on hot, which will cause buckets to last much longer than they otherwise would. The word "Fire" should be painted on them with large letters—red is to be preferred as that colour can be seen best—so that one may know their purpose, and readily discover them in case of emergency. All factories should have trained bucket brigades, as it is not easy to use a bucket properly. It seems an easy matter to pour water upon a burning substance; but when we consider that, in the majority of cases, it is impossible to reach the point of fire, and that, therefore, water must be thrown from a distance, it is self-evident that it is quite an art to throw the contents of a bucket on the spot necessary, without spilling or wasting the greater part of it. In order to make a bucket brigade efficient, they should practice once or twice a week. Every room which contains buckets should contain large casks with wide opened tops, so that the buckets may be readily refilled. I frequently find casks with the top so small that it is almost impossible to introduce the bucket into the opening and procure water, and it would be utterly impossible, in case of fire, when people are frightened to a craze. It is a notable fact that more than twice as many fires are extinguished by buckets as by any other means. The importance of having factory buildings properly equipped with them is therefore obvious.

**PUMPS.**—The oldest and first-described fire pump is that described in the *Spiritualia* of Hero, 150 years a.c. One of the best and strongest pumps, in places where water power is used, is the French Rotary. Its chief merit lies in its great strength. Its operation is due to the displacement of water between the teeth of two coarse gears. Its construction is very simple. There are no weak and small parts which break; no valves which require constant attention, while it is very durable, and wears out slowly. It should take its supply from the flume, and should be about 18 inches above the water level, so that it may not be flooded. Driving belts should not be used, as a fire will soon destroy these. In the same way bevel gears are objectionable, because they are apt to slide, causing the various parts to stick, and the pump to become worthless when most needed. Friction gears, when the pump is strongly erected, are perhaps best, although, when the heat becomes great, they become warped, but stand longer than any other arrangement.

**STEAM FIRE PUMPS.**—The pre-requisite conditions in choosing steam fire pumps are that they should be simple, strong, and which is included in the foregoing, there should be as few small and weak parts as possible, as these are apt to get out of order and break. All fire pumps should be supplied with a relief valve (which relieves excessive pressure), as, when the pump is running at full head, hose is frequently burst, and as it is often impossible to reach the pump during the fire, the hose with which it is connected becomes worthless when most needed. A fire pump should be placed where it is least exposed to fires, preferably outside in a fire-proof compartment, so that the attendant may have access to the pump to the very last, and the pump may still work even if the entire remainder of the property be destroyed.

(To be continued).

Gun-cotton is a very suitable reagent for detecting the presence of magenta or other aniline colours in archil or indigo extracts. It takes absolutely no colour, whether worked hot or cold, in indigo extract; and in archil extracts it requires only a very faint tinge; but if the indigo extract contains aniline blue or purple, it dyes up blue, and if there be magenta in the archil, it comes out red.

## The Fashion Magazines.

The following extract from fashion magazines are interesting as showing the classes of fabrics most in favour for the present winter season. One of the greatest novelties in Paris, in the way of woollens, is a thick material, with long stiff hairs of the same or of different colour, resembling prickles; this is called "sanglier"—wild boar. It is an eccentricity for which we do not predict great favour. "Oursine" is another, and is a remarkable thick flannel with hairy surface. The most original, however, is a thick and plushy woollen, with a myriad colours woven in, which render it quite chameleon-like in the movement of the folds. Pékins are more fashionable than ever, and there is apparently no limit to their variety; velvet stripes on silk or satin, plush on similar grounds, satin or moiré on silk grounds, alternate stripes of watered silk and velvet, *ad infinitum*. The woollen materials, with small crisp curls of silky wool on a plain foundation, are much in favour, and require but little trimming, handsome woollen braids being the most suitable for the purpose.—*Le Follet*.

Stripes are the order of the day, and form the chief novelty in all materials. In rich fabrics there are velvets, striped with satin, plush, and moiré; velvets with a frisé or terry stripe interwoven; velvets with stripes of silk basketwork or canvas; velvet with stripes of bead-work, &c., &c. Satin is striped with plush, velvet, plain and watered silk, and plain silk is similarly treated. One of the handsomest of these is a plain silk, having wide shaded velvet stripes; others are striped with narrow lines of velvet or plush. Striped woollens are equally numerous, and of infinite variety. Most of the stripes are wide, and of equal width, and preference appears to be given to those woollens striped in a raised pattern of velvet, plush, or bouclé woollen. Of other woollens, the plain canvas is still in great favour, but it requires to be mixed with a striped or figured texture to be really effective. Plain rich materials are much used, as velvet, plush, &c., and in many cases form the whole of a dress, except the front breadth, the pante as it is sometimes called. These breadths are being specially woven for front or sides of dresses, and are of very rich materials.—*The World of Fashion*.

The present fashion is such that any amount of variety may be obtained, and we need never be at a loss to respond to the caprices of the weather. The novelties in dress materials have never been so abundant. Almost all, both woollen and silk, are in stripes. There are stripes of several colours—side by side, raised, zigzag, and waved stripes. Rough cloths have taken the place of smooth cloths. Astrachan cloth may be had in all rich shades; it is light in weight, and resembles rough serge, and looks very well made up with velvet. Henri Deux guipure is quite a new material; of it there are many varieties, all woven to imitate a coarse lace placed over a stuff of a different colour. The silks of this season are mostly corded, or show velvet or plush stripes. "Faillie nonvelle" is the name given to a new class of corded silk. Fancy velvets have frisé stripes, some natte, plush-like velvet is seen speckled with gold-colour; Pékin velour rayé has an ottoman ground and velvet stripes. Bengaline velour rayé has a light ground and two colours in the stripes. Plush will be worn as much as ever. There are shaded plushes in brown and grey tints—not across from selvage to selvage, but shaded in stripes or close patterns—to be made up with plain plush.—*The Ladies' Gazette of Fashion*.

## Cotton Workers in the Olden Times.

The workmen in the cotton trade of a century and a half ago used nearly the same sort of tools and followed nearly the same ways as had been in fashion for a thousand years before, or as still prevail in some parts of India, the birthplace of textile workmanship. Most of the manufacture, true to the original meaning of the word, was done by hand in private houses, the largest factories rarely comprised more than 20 or 30 workmen, hand work being supplemented by mill power derived by the streams, at the side of which the humble buildings were erected. The old process of manufacture may be briefly described. The wool or cotton to be converted into cloth, having been first cleaned, was carded—that is, its filaments were opened up by a minute sort of fork, and spread out in



parallel lines, so as to form a loose ribbon of eight or more fibres, according to the thickness of the yarn required. A band of leather, supplied with iron bristles and coiled round a cylinder, was the card; and this preliminary stage has only been improved upon by scientific appliances for making the tufts perfectly regular, and working the card by machinery instead of by hand. The fibrous ribbon was next coiled round the spindle and subjected to the spinning wheel, which, till a century ago, differed little from the rude instrument now in use in India. The spinners, or spinsters, having adjusted one end of the ribbon to a large wheel, which they turned with one hand, fed it with the other, giving the fibre a slight twist as they did so, in order that the roving, as it was called, which was worked off from the wheel upon the bobbin, though still frail and porous, might have a little of the strength and cohesion of thread; the roving had to be again worked round the wheel, with slower feeding and a more rapid twist, to convert it into yarn fit for the weaver to work up. This yarn was made of two sorts—the warp yarn had to be very firmly twisted, so as to form the longitudinal substance of the web; the weft yarn to form the transverse substance or woof, though of equal thickness with the other, was looser and lighter. The yarns having thus been prepared by the spinner, were handed over to the weaver, who adjusted them to his old-fashioned and clumsy loom. In this loom the warp was round a beam, and thence drawn through two heddles consisting of twines looped through the middle, one half being through the front heddle, the other half being through the back heddle, and the two being so arranged that they could be alternately lifted and depressed by a treadle which the weaver worked with his foot, while, as the threads rose and fell, he threw backwards and forwards between them the shuttle, from which the weft uncoiled as it passed. The cloth thus produced was rolled on a beam opposite to that covered by the warp yarn, and was then ready for the market. The workmanship alone of a pound of coarse cloth, half cotton and half linen, as was then common, cost about 4s. 6d. in 1741, which is a great contrast to the price of cloth complete at the present day. —H. R. Fox Bourne.

### A Ruined Industry.

It being the intention of Messrs. Marshall and Co., to close their flax mills in Leeds and Shrewsbury, *The Yorkshire Post* gives the following interesting particulars of the flax industry. "Thirty years ago, this industry afforded remunerative employment for from 15,000, to 20,000 people. Thirty-five years back there were between thirty and forty mills devoted to the spinning of flax in Leeds and the immediate neighbourhood. Now there are not more than four or five. One after another these factories—all comparatively new—have been closed, and to-day not more than from 4,000 to 5,000 people find work in the flax mills of Leeds, including between 1,500 and 1,800 at Messrs. Marshall's. Among the spinners and merchants who have found it impossible to compete with continental firms may be mentioned Messrs. Hives and Tennant, Messrs. Wilkinson, Messrs. Hammond, Messrs. Benyons, Messrs. Hargreaves, Messrs. Holdsworth, Messrs. Lobley, Mr. Mark Walker, Messrs. Brooksbank, and Messrs. Morfitt. These are but instances that recur to the memory. They might, undoubtedly, be considerably multiplied by means of very little inquiry among the few houses still carrying on business. In addition, about ten or twelve important mills in the surrounding district have been closed, including one worked by Messrs. Marshall in the East Riding of Yorkshire, and a similar fate has befallen nearly all the flax mills of Lancashire, Norfolk and Suffolk. At one time a good deal of flax was grown in this country. Indeed, some sorts of Lincolnshire-grown flax used to fetch about £120 a ton. A considerable acreage of flax was formerly cultivated in the neighbourhood of which Selby is the centre. Here again, as indeed, almost everywhere throughout England, the industry has almost completely decayed. When the flax trade was in the zenith of its prosperity, both manufacturers and merchants made very handsome profits, notably the firms who showed enterprise by adopting improvements in spinning and other machinery. What, it will be asked, has become of the flax trade that during the present century has done so much for Leeds? Has it gone to Dundee or to Belfast, the two greatest surviving British emporiums? No. Has some substitute been found for the article that used to be sent from Yorkshire all the world over? No. The answer, which flax spinners one and all give, is that their trade has gone abroad, chiefly to the continent. Here are a few facts, which speak for themselves. Thirty-five years ago, as already stated, there were in Leeds between thirty and forty flax mills. The flax factories of Lille then numbered three or four. To-day over fifty flourishing mills exist in Lille, while there are only about one-tenth of that number in Leeds. This comparison, with varying proportions, might, it is said, be truth-

fully extended to Belgium, Germany, parts of Russia, and other continental countries. What, then are the causes of this transference of the flax industry of England to the countries for which England was, until ten or twenty years ago, the main source of supply? Broadly stated, the principal causes are—1st, the prohibitory tariffs which continental nations have placed upon yarns, &c., imported by them from this country; 2nd, the longer hours worked in continental flax mills, in comparison with the hours worked in England. Other minor causes have contributed to the decline of the Leeds flax trade; but beyond doubt the downfall of this important industry is chiefly attributable to these two disadvantages, against which the English spinner has had to contend. In recent years the flax machine-making firms of Leeds and other centres have been sending to the continent much more machinery than they could possibly find customers for in this country. Some of the Leeds spinners who have shared the fate of the majority, say that, with very careful management, they were up to the time of the passing of the last Factory Act in this country, just able to hold their own against continental rivals. That measure reduced working hours to a point which put all profit out of the question. Continental spinners work from 75 to 78 hours a week. Were English spinners, it is represented, allowed to do the same their employers might reduce their goods 8 per cent. and make a profit. The continental spinner can do as much work per spindle per hour as the English spinner. The tariff levied upon the English product by some continental countries is nearly 40 per cent. Thus, having everything in their favour, continental spinners are thriving in at least the proportion that English spinners are finding their business slip away from them. At many continental factories, by means of relays of operatives, machinery is kept running 24 hours a day. The continental manufacturer has access to our markets abroad on the same terms as ourselves, and has also free access, with remarkably cheap freights, to our own ports. Flaxen goods are carried from Königsberg to Hull for very little more than it costs to bring them from Hull to Leeds, and for about a third the charge for carrying them to London from Yorkshire. Under these and other exceptionally favourable circumstances, it is represented that the continental spinner, on finding his stock accumulating, rather than reduce prices at home, sends his surplus yarns to this country to sell at any price, in order to maintain the rates current in his own country. One of the most experienced men in the Leeds flax trade states that up to ten years ago not a bundle of foreign yarn came into this country, and that now our markets are abundantly supplied from the continent. To the question, "What would you propose as a remedy?" the answer was "Either reduce wages or lengthen hours of work in England, or put a protective duty on our imports."



The Macclesfield Chamber of Commerce, in reply to the questions submitted by the Royal Commission on Trade Depression, attributes the gradual decay of the silk trade to foreign competition and to the unsatisfactory fiscal arrangements, as well as to the large amount of adulterated silks imported from abroad. The opinion is expressed that, unless something is done to protect this industry, it must eventually leave the country. Better technical education is also suggested as one of the remedies.

At a meeting recently held at Batley, at which deputations from the Chamber of Commerce, Mechanics' Institute, Working Men's Club, and the Co-operative Society were present, a discussion took place as to the necessity of establishing a technical school in that town. The Chamber of Commerce has already provided classes for weaving, of which about forty members avail themselves; but it is considered advisable that an institution should be founded which would supply all the advantages to be derived from a thoroughly practical technical school. We hope the discussion will lead to a practical result.

A prominent firm gives these directions for measuring belts. When convenient, measure the distance round the pulley with a piece of marine or tarred rope (it will not stretch as a tape line or string will) and cut your belts, if to be butted, about  $\frac{1}{2}$ -inch short for every ten feet in length of marine; if endless, allow for lap. When not convenient to measure the length round the pulleys, add the diameter of the two pulleys together, divide the result by two, and multiply the quotient by  $3\frac{1}{2}$ ; add the product of twice the distance between the centres of the shafts and you have the length required.

The Madras Chamber of Commerce, in a communication to the Indian Government, expressed the opinion that a false step was made when the import duties on Manchester goods were abolished, and alleges that although this was done avowedly in the interests of Free Trade, the dues were actually abolished in the interests of British manufacturers. The Chamber strongly urges that in view of "a chronic deficit and starved public works," the Government of India should consider the advisability of reimposing the dues. What would the Madras Chamber of Commerce say if it were attempted in this country to levy a duty upon the Indian imports coming into England?



### Receiving Orders

Baxter, Joseph, 120, Beeston Road (late 23, St. Paul's Street), Leeds, wool buyer, late wool merchant.  
 Cook, H. H., Cook, W. S., and Hepworth, H. (trading as Cook, Hepworth, and Co.), Toronto Street, Leeds, Yorkshire, woollen manufacturers.  
 Dawson, John Waugh, Cross Heath Mills, near Newcastle-under-Lyme, and The Brampton, Newcastle-under-Lyme, cotton spinner.  
 Firth, I., Market Place, Heckmondwike, Yorkshire, tailor, draper and carpet manufacturer.  
 Scarth, J. G., Bruntcliffe, Morley, Yorkshire, woollen manufacturer.

### Adjudications of Bankruptcy.

Kershaw, W. P., and Pickford, F. (trading as Kershaw, Pickford, and Co.), 15, Broad Street, Manchester, warehousemen.

### Dissolutions of Partnership.

Astle, T., and Lumbery, F., Long Eaton, Derbyshire, lace manufacturers.  
 Ashworth and Barker, Greengate Street, Oldham, cotton doublers.  
 Cooper, J., and Smith, A., Leeds, Yorkshire, cloth manufacturers.  
 Halsted, H. R., and Firth, J., 39, Swaine Street, Bradford, Yorkshire, stuff manufacturers.  
 Sagar, W., and Robinson, J., Foulridge, Lancashire, woollen manufacturers.  
 Tattersall, J., and Tattersall, W., Manchester, yarn and cloth manufacturers.  
 Wilcock, Wm. John and Frank, Peckett Well, Wadsworth, Halifax, cotton manufacturers, and Scar Bottom and Square Shed, Mytholmroyd, Halifax, cotton manufacturers and oil merchants.

### PATENTS.

#### Applications for Letters Patent.

Apparatus in spinning mules. W. Heaton and J. Catterall, London. 23rd Oct. 12,717  
 Apparatus for dyeing or treating woven fabrics. T. Salt, Saltaire. 29th Oct. 13,029  
 Apparatus for dyeing or treating woven fabrics. Sir T. Salt, Bart., Sons and Co., Saltaire. 29th Oct. 13,030  
 Apparatus for a method of making net ground on ordinary lace curtain machines. E. Edwards, London. 29th Oct. 13,046  
 Apparatus connected with looms for regulating the letting (or taking) off of the warp or warps from the warp beam or beams in looms for weaving figured or plain reps, worsted or woollen coatings, &c. J. T. Lishman, Bradford, and W. W. L. and W. R. Bootland, Silsden. 12th Oct. 12,122  
 Apparatus for pulling and planking woven or felted woollen goods, &c. J. Southworth and P. Richardson, Manchester. 17th Oct. 12,396  
 Adjusting the feed knife of Noble's and analogous feeding machines. A. Benn, Bradford. 17th Oct. 12,406  
 Belting or bands for transmitting motion. H. S. Taylor, London. 27th Oct. 12,873  
 Bobbins. W. R. Cant, Glasgow. 27th Oct. 12,888  
 Buffer or picker savers for looms. J. W. Crowther, Halifax. 9th Oct. 11,991  
 Beaters or guard rollers of carding machines—method of applying the same. W. H. Greenwood and F. Farrar, Bradford. 10th Oct. 12,061  
 Carpets and other terry and cut pile fabrics. G. Marchetti, London. 3rd Oct. 11,794  
 Cop rail and winding apparatus for mule spinning machines. J. Jackson and W. Hazlehurst, Rochdale. 27th Oct. 12,890  
 Connecting and disconnecting gear for looms and other machinery driven by bands, belts, or cords. W. H. Beck, London. 24th Oct. 12,792  
 Covering metallic rollers, drums, pulleys, wheels or cylinders with leather or similar materials. B. Oddy, Bradford. 27th Oct. 12,933  
 Cylinders for printing continuous patterns on webs of textile fabrics. E. Vanoni, London. 17th Oct. 12,426  
 Drawing and drafting combed textile fibres and machinery. E. Maertens, London. 5th Oct. 11,845  
 Decorticating ramie, &c. H. J. Haddan, London. 6th Oct. 11,892  
 Driving belts or flat bands and apparatus employed. R. Dick, Glasgow. 14th Oct. 12,254  
 Driving spindles used in spinning, twisting, or winding. A. King, Glasgow. 16th Oct. 12,334  
 Dyeing, scouring, &c. J. H. Ashwell, Liverpool. 20th Oct. 12,534  
 Drying skeins of yarn. H. J. Haddan, London. 20th Oct. 12,552  
 Driving belts. F. Bosshardt, London. 21st Oct. 12,595  
 Driving belts or bands. W. R. Lake, London. 23rd Oct. 12,744  
 Fastening for driving belts or bands. A. Morton, Sheffield. 23rd Oct. 12,688  
 Finishing lace. W. Jennings, London. 24th Oct. 12,782

Figured cloth. J. Kirkham and W. Tristram, London. 7th Oct. 11,919  
 Fast and loose reed arrangements and brakes employed in looms. T. Singleton, Halifax. 8th Oct. 11,951  
 Fustian cords. J. Schofield and J. E. Bentley, Manchester. 12th Oct. 12,007  
 Fastening or coupling for leather, cotton, or india-rubber belts or straps. D. Wilson, Cappoguin. 12th Oct. 12,119  
 Flat carding engines. E. Tweedale, Halifax. 21st Oct. 12,589  
 Gig mills for finishing woven fabrics. C. E. Moser, Leeds. 30th Sep. 11,640  
 Gill fallers. E. Clarkson, Halifax. 12th Oct. 12,094  
 Jacquard apparatus. F. S. Beard, London. 8th Oct. 11,978  
 Lace and other fabrics and machinery therefor. H. S. Cropper and W. Birks, London. 24th Oct. 12,769  
 Looms for rugs, &c., having the pile formed from chenille. W. H. Gladding, London. 7th Oct. 11,938  
 Looms. W. J. Monk, Manchester. 10th Oct. 12,054  
 Looms. F. W. Jepson, Halifax. 12th Oct. 12,093  
 Looms for tufted carpets and other tufted pile fabrics. Henderson and Co. and E. Buckley, London. 15th Oct. 12,289  
 Leno weaving. E. Smith, Manchester. 17th Oct. 12,388  
 Measuring carpets, &c., in a winding machine. W. R. Lake, London. 6th Oct. 11,889  
 Machines for dyeing, sizing, and wringing hanks. J. Robertshaw, Manchester. 9th Oct. 12,002  
 Metallic combs for weavers. J. Southworth and P. Richardson, Manchester. 17th Oct. 12,396  
 Method of and apparatus for manufacturing fringe ribbons to be used in the manufacture of imitation Smyrna carpets. C. D. Abel, London. 24th Oct. 12,779  
 Manufacture and treatment of figured woven fabrics, whereby is produced a brocaded plush or figured fleecy surface. J. Edleston, Manchester. 29th Oct. 12,994  
 New method of looping yarn during the operation of weaving for the production of a looped fabric. A. Broadbent, Halifax. 23rd Oct. 12,690  
 Obtaining and treating fibres from the barks of plants of the urtica family, &c. G. F. Redfern, London. 30th Sep. 11,660  
 Pickers for looms. R. Clayton, Manchester. 3rd Oct. 11,783  
 Picker protector for looms. R. Mason and T. Parker, Accrington. 7th Oct. 11,906  
 Picker saver and web check for looms. J. F. Walmsley, J. Shackleton and J. Heap, Accrington. 27th Oct. 12,864  
 Preparation of warps of cotton or linen yarn for weaving purposes. T. Pickles, Manchester. 29th Oct. 12,992  
 Regulating the motion of warp beams in looms. J. Smith, London. 24th Sep. 11,564  
 Reeling or winding yarn or thread. W. Noton, Oldham. 16th Oct. 12,321  
 Stop-motion for machines for doubling cotton, &c. J. Holroyd, Manchester. 27th Oct. 12,863  
 Shuttles. E. Critchley. 27th Oct. 12,925  
 Swells for fast reed looms. C. C. Stout, Stockport. 2nd Oct. 11,732  
 Shifting driving belts or pulleys. E. Edwards, London. 2nd Oct. 11,765  
 Spinning rings and travellers. H. L. Hayden, London. 6th Oct. 11,878  
 Spinning and doubling cotton, &c. T. Ashworth, Manchester. 10th Oct. 12,057  
 Shuttle tongues for looms. J. Pickering, Halifax. 17th Oct. 12,386  
 Smyrna or Turkey carpets. C. Spannagel, London. 19th Oct. 12,461  
 Shedding motion for looms. D. Bailey and S. Stead, Halifax. 20th Oct. 12,515  
 Stripping carding engine cylinders and doffers. P. Muller, Manchester. 22nd Oct. 12,636  
 Terry weaving. E. Tootal, Broadhurst and E. Smith, Manchester. 1st Oct. 11,676  
 Terry weaving. E. Tootal, Broadhurst and E. Smith, Manchester. 7th Oct. 11,918  
 Twist lace. F. and H. Simpson and E. Harris, London. 8th Oct. 11,947  
 Treating flax, &c. G. F. Redfern, London. 9th Oct. 12,044  
 Treatment of linen yarns used in weaving for the purpose of "creaming" the same. T. Pickles, Manchester. 29th Oct. 12,993  
 Throstles and other analogous machinery for preparing, spinning, and twisting fibrous materials. R. Patterson, London. 20th Oct. 12,530  
 Warp lace machines. J. Hudson and J. Jardine, London. 5th Oct. 11,830  
 Washing wool, &c. W. H. Greenwood, Bradford. 10th Oct. 12,055  
 Weaving cut pile fabrics. S. Webstuhlfabrik (L. Schönherr) and O. Hallensleben, London. 15th Oct. 12,318  
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 Woven fabrics. A. Mitchell, Bradford. 19th Oct. 12,452  
 West-stop motion. C. Bedford, Halifax. 27th Oct. 12,805  
 Yarn beaming machines. A. Hitchon, Accrington. 23rd Oct. 12,702

### Patents Sealed.

10,570	13,353	4,367	4,973	7,644	7,650	13,772
13,831	14,225	14,338	7,382	7,766	7,811	13,258
13,815	7,953	13,533	12,810	14,741	8,052	13,889
14,028	15,035	8,243	13,159	14,223	13,374	13,491
13,505	14,304	14,599	14,637	6,956	8,070	11,763
12,399	13,777	13,970	14,174	14,535	14,574	16,723
7,853						



# The Journal of Fabrics

AND

## Textile Industries.

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### The Getting-up and Finishing of Goods.

(By our Special Trade Commissioner.)



THE proper make-up and finishing-off of textile goods, in readiness to be placed in the hands of the retailer, is a matter of much greater importance than many manufacturers appear to be willing to concede to it. Even those for whose special advantage extra pains may have been taken in this direction—the retail draper—is but too apt to undervalue them, and when his attention has been modestly drawn to the nice and effective manner in which certain fabrics are finished, will often airily reply, “Oh! its the stuff itself I look at, not the way it's got up.” This is sensible and practical enough, as far as it goes, but after all, a certain amount of finish exercises a very important effect upon the goods themselves and their success in the trade, and frequently is the means of indirectly influencing their sale, both in the wholesale and retail alike. To give as forcible an example of this as my memory will allow me to do, I may appropriately quote the really remarkable instance of the sale of those deteriorated fabrics, as

regards quality, which got at last to be sold under the *sobriquet* of “Japanese silks.” These, as the trade are aware, in the first place, used to consist of silk warps, shot with cotton, and a great many were sold, particularly in the form of black stripes on grey grounds. The quality of these became gradually so reduced to meet the exigencies of trade, that the silk at last was left entirely out, and the fabric consisted literally of sheer cotton alone. In this form, they were actually nothing more than a slightly dressed gingham of fine counts, which could be produced and sold at a large profit at sixpence a yard. They were got rid of in large quantities for a certain period of time, until people began to find out what they really were, and their sale, in this shape, was due almost entirely to the fact of their being put up in stiff paper, or in thin cardboard covers, in the same way in which it is usual to envelope silk goods. They were shown in the retailer's window in this way, puffed out in attractive folds by the window-dresser, the careful wrapping putting a fictitious value upon the material, which would have been scouted by many had it sailed under its proper colours, as it may be expressed. In the New York auction sales of dry goods, they sold for a brief season in this reduced quality to an enormous extent; cases after cases being rapidly despatched “across the water” to meet the demand. So brisk a business was done in them for the time being, that the home trade could not get enough of them at first, the Americans being willing to pay a farthing a yard more than buyers in England, so as to secure an early supply while the demand was “on,” which is everything in the American trade. It is true that the reaction came, and that no small number of cases intended for the New York market were countermanded, and hung heavily on hand for a length of time, and had to be jobbed off at a considerable loss; still the circumstance will point the moral I have in view, which is to show that the effective getting up of goods is a very important factor in their sale, and a significant lesson may be learned from the example I have quoted, although it may properly be regarded as an extreme case, for the goods were only sold by reason of their finishing, or the way in which they were got up. Had they been offered to the trade merely as what they were, a narrow cotton fabric, they would not have found a market at all, for nobody would have bought them, as their narrow width would have been against them, amidst the range of ordinary ginghams and goods of that class, with which they would have had to have been associated. New materials, or fresh makes of any class of fabric, should, more especially, be got up with some novel contrivance as to finish; and some little departure from the old stereotyped methods commonly in use should be made, as, by this means, they will wear a more complete air of freshness, and provoke extra attention. Some goods are naturally more dependent upon their finish than others, especially in the case of plain fabrics. Nothing could give a more striking instance of this than linens and lawns. Here, so to speak, is a comparatively unmeaning, plain white cloth that, under ordinary circumstances, would be very difficult to deal with. But creased down the middle, and banded with a gilded paper band fastened in the fold by gold braid, a piece of four quarter, or seven-eighths Irish linen, becomes a very handsome object, and an adornment to a draper's window when he makes a “white show,” and the same with lawns. An old-fashioned device being a stag or hart, transixed with an arrow (familiar to all drapers), when otherwise, a plain white fabric could not, by itself, possess the slightest claim to attractiveness. Some of the best got up goods of late years have been velveteens, which, it must be confessed, have been largely pushed into notice through advertisement. The outside of many of these are illustrated by pictures, mostly of beautiful female forms, that are executed with life-like distinctness, that are really works of art, in the fullest sense. The cost of even an expensive illustration of this character, when spread over so many yards in a piece of goods, amounts to but a mere fraction, and the sale is undeniably facilitated by such finishing. I was lately shown some most beautiful novelties in this way by Messrs. Marion and Co., of Soho Square, London, the celebrated wholesale dealers in photographic materials, which they are getting out for the new year, and it is unquestionably through their means that much of the attractiveness of velveteens in the hands of the retailer is due, who, although, as said before, he may affect to ignore the fact, still it has a very material influence upon the sale of goods thus decorated. I was shown, the other day, in a leading London warehouse that

has a reputation for bringing out novelties in dress goods, a fabric that was made not far from Bradford, of bright hair yarn of alpaca or mohair, in checks and stripes, that closely resembled silk in appearance. They were first attempts, and presented a most beautiful aspect, but being in short lengths, were soft and flabby as a piece of goods to handle, and were very badly got up. I said at once to the buyer:—"If these were put up in stiff paper after the fashion that silks are done up, they would take twice as well with buyers." He agreed with me, and added, "if they were papered as you say, we could make a small pile of them here at the end of the counter, and they would keep in better condition," thus showing that the point could be regarded from more views than one. Great improvements have, of course, been made in recent years in the manner in which many goods are now finished, but, while some departments have signalized themselves in this way, others are still far behind-hand in this respect. Boxes are now largely resorted to, and the paper-box trade has become a very extensive one. Delicate and fragile objects are thus protected and kept in condition, which otherwise are soon put out of order. Formerly, Coventry ribbons were sold "spindled," merely twisted round on a small bit of stiff paper to make a beginning, and were kept on the warehouseman's counter in this way till they were sold. When the draper had selected his parcel of ribbons, the basket was taken to the blocking wheel in connection with the department, and each piece was "blocked" on a wooden block. The French ribbon manufacturers, on the other hand, were in the habit of blocking their goods before they sent them out to the warehouseman, with a continuing strip of paper all through, and boxed-up in cardboard boxes, made to measure, and to fit the ribbons exactly. The retailer thus could show his box of ribbons in his window in a convenient form, and much more than that, instead of often buying two or three pieces, he would be induced to buy a box, which might hold six pieces, more or less, according to width, so that there may be two or three indirect considerations involved in the effective getting-up of goods. The Coventry manufacturer has learned his lesson at last, and now boxes up his goods in the same way, and blocks them with continuous paper, but there is, unfortunately, little trade left to him, comparatively speaking, for the greater part of the ribbons that are now sold come collectively from France, Switzerland and Germany. Even hosiery is often now sold boxed up, when at one time it was almost exclusively put up in paper, with a bit of cardboard at top and bottom, and tied round with string. I remember, upon one occasion, a good many years ago, travelling down from London to Nottingham with one of Messrs Stewart and Co's. men of New York, who was a large buyer of hosiery, and he was complaining to me of the obstinacy of manufacturers clinging to old forms, and old methods.—"Pig-headedness," he called it, and he illustrated it by an example which he quoted. "I bought," said he, "once, a parcel of a man, and remarked that I wanted them got up in boxes." "Boxes?" replied the manufacturer, "we never box these goods, we always put them up in paper." "Never mind what you are in the habit of doing," was the response, "I want mine put in boxes." "That," returned the maker, "we never do, it's not the trade form for such things. We don't know how its done, or anything about it," &c., &c., "and I had the very greatest difficulty," added the American, "in getting my goods put up in the form I wanted them to be put into." Now, here is the case, as will be seen, of the customer suggesting the finish, but it will occur to many that goods ought to be put up in the first place by the manufacturer in their most inviting forms, so as to need no urging in this respect from the buyers. Competition is now so close, both amongst ourselves and foreign producers in every branch of textile production, that the balance of worth, or value, often trembles in the scale, as it were, and it is by attention given to a number of little points, that collective excellence only is to be obtained, amongst which the proper getting up, and finishing of goods is certainly not the least important.

Adulterations of animal oil or mineral oil may be detected by adding concentrated sulphuric acid, when the animal oil will be charred, forming black rings in the sample. Vegetable or animal oils can also be detected by adding an alkali to the sample, thus causing them to saponify, as mineral oils have not the property of saponification readily. Oils are frequently adulterated with cotton seed oil, which is prone to ignite waste spontaneously.

## The Ventilation and Sanitary Conditions of Cotton Mills.

The want of knowledge of sanitary laws, too often found even in the dwelling-houses of the wealthy classes, is more strikingly exhibited in our workshops. The admission of sewer gas into the rooms of mills, the air of which is already, more or less, vitiated by the combustion of gas, and the production of friction, cannot but have a deteriorating effect upon the health and strength of the labour employed. This effect may not be at once visible to the management, because sewer gas does not, as a rule, take hold of the strong; and it is only when such become, from some temporary cause, out of health, that the detrimental effect becomes visible. It is an acknowledged fact that an operative, who is accustomed to a machine, can produce more work from it, at less cost, than a stranger, provided that the two operatives are of equal skill; it is, therefore, to the interest of all mill owners to see that the conditions, under which the operatives follow their employment, are not such as may cause them to contract disease. It is most usual to place the "conveniences" adjacent and in direct communication with the room in which the operatives, who use them, work, so that they may not have to waste more time than can be absolutely helped, and, also, that they may not, by leaving a heated atmosphere, and by traversing a, too often, draughty mill yard, experience a chill, with the possibility of having to stay at home as the consequence. The soil pipes from these conveniences are sometimes conducted to soil tubs or cans, but are, in towns, generally connected with a sewer. In the latter case, until lately, it was the exception to find the soil pipes properly trapped, or ventilated; even when trapped and ventilated, it is quite the exception that the arrangements are found to be efficient. No sewer trap, that we know of, is able to prevent the passage of sewer gas for the space of twelve hours, when the trap is between the sewer and the soil pipe of a convenience, the door of which opens immediately into a heated room of a mill, even when the water supply for flushing the pipe is not stinted. It is, however, not by any means usual to find in mills an unsinted water supply for this purpose. In the majority of mills, we venture to assert that the supply of water is very much stinted, being, in fact, generally only used when a most distinct nuisance arises from the bad odour coming from the conveniences. When carefully considering this question, it must not be overlooked that the variations of temperature always, more or less, found in all mills during every twenty-four hours, largely increases the liability of drawing sewer gasses into the rooms, even when the most efficient traps procurable are used. The evil practice, too often indulged in by the operatives, of making the conveniences a receptacle for waste and spoiled work also increases the difficulties which surround this question, and as this practice is one which may cause much loss to the mill owner, it is necessary that, in all arrangements made, care should be taken that some means of ascertaining the extent to which this practice is indulged in by the workpeople should exist. In many concerns, sewer traps have had to be removed simply on account of the trouble caused by this waste blocking up the trap. Many of the more ancient concerns have their conveniences connected with cesspools. This arrangement is not, however, now permitted by the sanitary authorities of those districts where sanitary conditions are strictly enforced. Nothing can possibly be more injurious to the health of the surrounding district than these cesspools which, as a rule, have their contents emptied out only twice a year, viz.:—in the spring and autumn. To ensure perfect sanitary arrangements, it is absolutely necessary that the following conditions should exist. The convenience must be so placed that a free current of air shall pass between it and the door opening into the room. If the convenience be connected with a sewer, it must be efficiently trapped, or if not connected with a sewer, arrangements must be made so that the "excretion" shall be removed every two or three days. As both of these conditions are very easily attainable, and, in the case of building a new mill, at a very slight extra cost, it can only be supposed that the reason why so few mills, comparatively, are to be found where these conditions have been observed, is that neither owner nor architect has given this matter any attention. It will be necessary to divide mills into two classes, viz.:—those which are built upon the ground floor,



and those which consist of two or more stories. For the former, a brick built shed, situated from about four to six feet from the door which leads out of the room to the convenience, is all that is necessary. From this door to the brick built shed, a brick passage should be also erected, with walls about eight feet high; the upper two feet of this wall should be perforated by leaving out a half brick after every whole brick. This passage should not be roofed in, but left open to the sky. In manufacturing concerns, where both men and women are employed, and where it is no unusual thing to find a number of conveniences placed together, this style of convenience would be found to cost very little more than those at present in vogue. When the conveniences used by the men are adjacent to those used by the women, it is necessary, for the sake of decency, to have the partition wall a foot or two higher. In no case should the passage or convenience be wider than is just necessary for a person to pass up the passage. Mill managers have often to complain that, when made more commodious, they are used as places for a "camp." At those places where a sewer is available, we should strongly recommend the use of the trough water-closet, which is made in Glasgow. We know of no arrangement by which a manufacturer can so easily ascertain, from day to day, whether he is being defrauded by his workpeople making away with his property. This closet also forms a more perfect trap against sewer gas than any other of which we have knowledge, the water flush being in volume many times greater than any other. No waste of water is possible, a matter of some little importance when all the water used has to be paid for. Where no sewer exists, galvanised iron or zinc tubs should be used, not wooden boxes, which are neither sanitary, nor, in the long run, economical. Dried ashes should be used unless the pails are emptied every day during the summer. The use of ashes is well worth the extra trouble, as, by using them, the contents of the boxes are increased in value. Nor must it be forgotten that it is necessary to use some kind of disinfectant when any kind of boxes are used. This must be sprinkled over the pails, and also over that part of the building where the pails stand. It is not as easy to get the same sanitary result when the conveniences have to be placed in other stories than on the ground floor. Good results may be obtained, though the cost would be greater. In the case of a spinning mill, as the upstairs conveniences are, as a rule, only required by members of the male sex, the arrangements may be simplified somewhat. It will be necessary to build a tower up the mill, which need not, of course, be of any great stability. Its inside measurement should be about six feet by two feet, and the three feet nearest the mill should be loop-holed the whole way up, so as to permit of a free current of air blowing through. With such a tower, it is nearly impossible for any sewer gas to enter into the rooms. We again recommend the trough closet where sewers are available. These closets have the additional advantage, when situated in a tower, of keeping the soil pipe free from obstruction. Even when not connected with a sewer, but with tubs or pails, we think the advantage named quite worth the cost. With these closets, a flushing of water, mixed with some disinfectant, would keep the soil pipe from becoming offensive. It will, perhaps, be noticed that we make no mention of the usual form of water-closet. From a pretty varied experience of these for mill use, we have condemned them as being inefficient; always out of repair—either stopped up with cotton in process, or with the flushing arrangements out of order. Our experience has been that, without constant attention, the water is either running away all day and all night, or that it is not doing its duty of flushing after the convenience has been used. A word for those who possess mills built before these matters commanded the attention they now receive, and who, whilst perhaps desiring to improve the arrangements existing at their mills, do not see their way to the outlay of any considerable sum of money. To these we would say, arrange at once for a free current of fresh air to blow between the necessities and the mill; this is the *one* essential point. Should you then be troubled by bad odours from the soil pipe, affix an air extractor to the top of the pipe. By this means you will, at least as long as the engine is at work, prevent the bad odours from entering your rooms. But, besides this, if you arrange that there shall be sufficient opening for the admittance of pure air at the bottom of the soil pipe, you will find that the oxygen you thus force through the pipe, will

so disinfect it, that, even when the engine is stopped, and, consequently, the air extractor, the offensive odour, if not quite removed, is, at any rate, so much mitigated that it becomes no longer a nuisance and a danger. These air extractors have been sometimes placed in the position indicated, and used at the same time to draw the hot air from the several rooms, but this arrangement is much to be deprecated, as the heated air, in passing through the soil pipe, must of necessity, hasten the decomposition of any deposit, and the gasses arising from this decomposition would, when the mill was closed, find their way into the rooms of the mill. The soil pipe should also always be carried above the roof of the mill, and should be left open at the top to allow the gasses to escape. This simple alteration will often effect a sensible difference, where complaints were previously made of the bad odours proceeding from the convenience, but this cannot be considered as a case, as, under some conditions, the air will be drawn down the soil pipe into the rooms. We have endeavoured in this article to indicate the cheapest effectual arrangements, and have purposely avoided discussing such as are excellent in themselves, though too costly for general adoption for mill use.

### The Electric Light in Mills and Dye-houses.

One of the greatest improvements of modern times in textile factories, dye-houses, &c., is that of electric illumination. The results that have followed its introduction have been most beneficial in many respects, both with regard to improvements in the health of the workers, and in the superiority of the goods produced. It is a well-known fact that, to produce colours of delicate shades in dyeing operations, light plays a most important part, and unless the light is good, a dyer, be he ever so expert, labours under a great disadvantage. It is at this point that the electric light works wonders, and enables the operative to class his shades with almost as great a certainty as if the brightest sunlight shone on the goods. As a consequence, it is at present receiving much attention from those interested in the production of fabrics in which perfection of colour is a desideratum. The only drawback to its general adoption is its apparent expensiveness when compared with the price of gas, but when looked at in all its bearings upon manufacture, this general opinion is, to a great extent, a fallacy, and it needs very little argument on our part to prove the truth of this statement. In taking into account the price of gas as taken from and paid for to a company or corporation, and contrasting it with the cost of the electric light, the former comes out to advantage as far as the first money payment is concerned, but there are other considerations to be observed when comparing the relative values of the different methods of lighting. In the first place, its tendency to heat rooms, in a greater or lesser degree, according to conditions, is deleterious to the health of the operatives, and, in consequence, it affects their working powers. We could give numbers of instances in which the use of gas has been superseded by the electric light, and an improvement in the physical condition of the workers has speedily followed. Then again, with the electric light, more perfect work may be produced by the operative, with a less expenditure of eyesight, as it is, as a rule, considerably purer and steadier than gas, especially if proper attention is taken in the production of the electricity, and if the light is placed in positions so as not to fall directly in a line with the eyes. Then, as stated above, in the production of coloured work, there is a great saving of time, for it is totally impossible to judge of the true shades of many colours by the aid of gas, whereas there are very few shades that cannot be accurately gauged by the electric light. Here are, then, some very simple arguments in favour of the light, which, if put into practice, will speedily convince the sceptical of its superiority. There are numbers of companies and private firms that now tender for its supply throughout the textile districts. It is only a question of time, and lighting by electricity will become general in factories of all descriptions, as, there is not the slightest doubt, when taking all considerations for and against it into account, that it is immensely superior to gas in every respect.



### Further Remarks on Novelties.



IN our November issue, we had an article upon novelties in the textile trades, showing the necessity for special efforts in this direction, with a view to brighten, what is generally admitted to be, unparalleled dulness in trade. We also gave suggestions for the making of various goods which we designated novelties. Now that the general election is almost a thing of the past, and the excitement and, consequently, the corresponding apathy in business matters are at an end, we may look forward to a return to the beaten track of business routine, therefore, it is possible that further suggestions from us, for the production of novelties, may be received by manufacturers with that degree of favour which our previous hints may not have gained from those of our readers whose minds are politically bent. But, before proceeding further, we should like to remark that it would be much more beneficial, in a business sense, if the State would enact that general elections should be decided within two or three days, instead of extending over two or three weeks. It may be ignorance on our part, but we see no reason why this should not be arranged. The benefit to the industries of this country would be marked, and any difficulties in the way of such an arrangement could, doubtless, be removed. But, to resume, the great favour, which fabrics of Kyrle, Spiral, and Knot Yarns have gained, is still maintained, and we hope to see some of our suggestions acted upon. There is scarcely a fabric for personal wear, particularly those for ladies, in which these yarns may not be introduced. There have, lately, been many handsome goods in the market composed of varied coloured stripes of plush upon plain grounds. These might be varied with a Kyrle, Spiral, or Knot ground, or alternate stripe. Then referring to Lenos—the above yarns could, to a certain extent, be introduced in the warp, with a very pleasing effect, by the use of a special reed, allowing for the free passage of the knots through the splits or dents. We also spoke in our last of the introduction of backed lenos, which, by the way, have not yet come upon the market, but may be expected early. Manufacturers would do well to give this cloth their early attention. It is capable of being employed for a variety of purposes, foremost, amongst which, may be named mantle cloths, and those manufacturers who have jacquard machines can

#### Produce Elegant Novelties.

as more scope is thereby allowed in the patterns than is possible where healds alone are employed. The expense involved in following our suggestion is slight, particularly for healds, in comparison with the benefit which may be derived. With a broad harness, a distinctly new departure could be attained by the making of these fabrics. Firstly, for table covers, then for toilet covers, counterpanes, &c. Some idea of the effect of such goods may be gathered from the following description of a table cover which could be made. First of all, we may here remark that a single figured leno is composed of a closely woven figure, upon an open net work ground. A backed leno is the same thing, with, as its name implies, a plain cloth woven behind. Therefore, a table cover, if of cotton, might be made of white or éeru leno, upon a delicately coloured back. This also applies to toilet covers, counterpanes, &c., whilst, for worsted and woollen, light shades of face and dark backs could with advantage be employed. An elegant, but more expensive, article could be made with the leno of gold or silver thread upon backs of rich and tasteful colours. In all classes of fabrics, the subject of colour is coming more to the front each season: the harmonising and blending of various shades requiring a display of the greatest possible taste. In the fabrics above mentioned, much scope is allowed for the exercise of this taste. We hear that gold and silver nets, studded with gold and silver balls, and pale-coloured silks, striped with gold and silver embroidery, are the latest Parisian novelties. Herein is a good suggestion for our home manufacturers. If more regard were paid to the craving for novelty amongst buyers, possibly, manufacturers would

not hear quite so much of Parisian, and other foreign novelties. But, it may be urged, and perhaps rightly, that these goods cannot be made at home to compete with the imported ones. If this be so, then the only way is to be always first in the field with better novelties to

#### Satisfy the Tastes of Buyers.

In our last issue, we drew attention to the printing of patterns upon linen goods. On another page, we give several small designs for cotton goods. These, when woven, would supply good materials for printing upon, in three or four colours. Patterns of Indian or Persian character would be most suitable. It may be interesting to notice a few remarks made by an American Exchange upon goods lately put upon the market in that country. Granada lace is first mentioned, this being a new black lace, the ground, of square meshes, being composed of very fine flat silken braid. The designs, which are woven in, are in Spanish patterns, in mat and open work, and outlined with a fine cord. It differs widely from Spanish lace. The writer continues by remarking its suitability for use in conjunction with the transparencies, over deep colours, which are to be worn next season. This shows a unity of opinion between ourselves and manufacturers across the Atlantic, on the subject of leno and gauze fabrics (i.e. transparencies), for next season, which we predicted some time ago, and which we have again alluded to in our present issue. Plush lace with plush figures on a rich and heavy mesh is mentioned as another novelty. This, however, is more suitable for winter wear, along with the heavier makes of goods. What the writer describes as the crowning novelty is a mauresque lace, in which are introduced point lace stitches, forming medallions and other figures. It possesses much of the richness of point lace, and comes within the reach of those of moderate means. We do not copy these American hints as implying in the slightest degree that the Broadway merchants are at all in advance of ourselves, but simply to show what is being produced there in the way of novelty. Having said so much of the Americans, we will resume.

#### The Rhea Fibre

is a material which has pushed its way to the front during the past year or two, and therefore it is not surprising that many beautiful fabrics are now produced from it in combination with other fibres. For the cheaper qualities of plush, as well as for a variety of other goods, its use is regarded in some quarters as of much value. And, whilst dealing with yarns, we should like to mention a display which we were shown the other day by an agent in Bradford. These comprised almost every variety with regard to style and quality of Kyrle, Knot and Spiral yarns, from the finest to the coarsest counts, and in small and large curls and knots. One of the neatest of these was a gimp yarn. Fancy worst-d yarns are also an important feature amongst this display. We have also seen a chenille yarn composed of rhea fibre, which is adaptable for many purposes, particularly for mantle cloths.

#### Commercial Failures.

According to *Kemp's Mercantile Gazette*, the number of Failures in England and Wales gazetted during the four weeks ending Saturday, November 28th, was 341. The number in the corresponding four weeks of last year was 296, showing an increase of 45, being a net increase, in 1885, to date, of 636. The number of Bills of Sale published in England and Wales for the four weeks ending Saturday, November 28th, was 1,055. The number in the corresponding four weeks of last year was 1,034, showing an increase of 21, being a net increase, in 1885, to date, of 551. The number published in Ireland for the same four weeks was 68. The number in the corresponding four weeks of last year was 58, showing an increase of 10, being a net increase, in 1885, to date, of 60.

A Russian journal states that marked success has attended the efforts made to introduce the growing of cotton in the Merv district. The plant has been pronounced to be quite equal to the Transatlantic article. This year's crop has been sufficiently abundant to allow the inhabitants of Merv to make a sending of cotton to Ashkabad. Attention is likewise being paid in the Caucasus provinces to trials in raising cotton.





## The American Power Loom.\*

BY ROBERTS BEAUMONT.

(Continued from Page 50.)



**T**HUS, in the ordinary system, the shafts are elevated by a series of jack levers fixed on the top of the loom, the fulcrums of which are in the centre. Each lever of this kind is supplied with jack blade, needle and spring. Further, there are, in machines of this character, two knives, or rocking bars, one for the elevation and the other for the depression of the healds. All the jack blades are on the upper or lifting bar before any lags are placed on the cylinder, so that, in this case, a peg is employed to press the blade off the upper knife, and thereby to cause it to be depressed by the falling knife of the machine. The rising and falling of the healds are, consequently, entirely dependent on the action of the jack blades; if these are elevated by the jacquard, the shafts are lifted, but if depressed, the shafts are sunken. This arises, in the first place, from the levers having their fulcrums in the centre, and, in the second place, from the upper heald shafts being connected to the blade end of the jacks, while the lower heald shafts, by means of streamers, are attached to the opposite ends. So that, when these levers are elevated at one end, they are depressed at the other, the effect of which, on the movements of the shafts, may be more clearly pointed out by a reference to Fig. 1. Here is furnished a sketch of the position of

B<sup>1</sup> and B<sup>2</sup> Jack Blades. J.L.<sup>1</sup> and J.L.<sup>2</sup> Jack Levers for elevating the Healds. J<sup>1</sup> and J<sup>2</sup> Jack Levers for depressing the Healds. S.W. Streamer Wires. C. Connectors. S<sup>1</sup> and S<sup>2</sup> Heald Shafts.

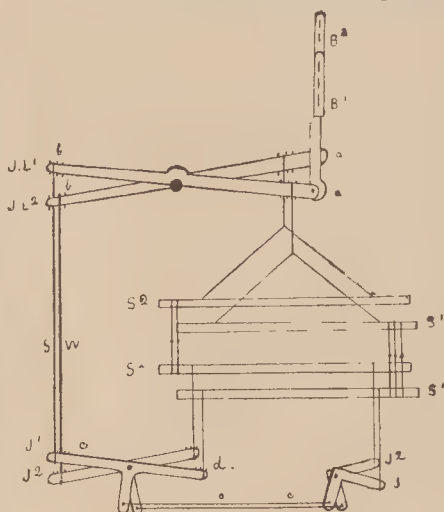


FIG 1. Ordinary Method of Shedding.

the levers in the formation of a plain shed. The blade of J.L.<sup>1</sup> having been depressed, in consequence of a peg forcing it off the lifting knife, it sinks at *a* and rises at *b*. Now the long streamer wires S.W. are connected to the jacks underneath the harness mounting, which, being also attached to the bottom of the shafts, draw them down as required. Thus, when J.<sup>1</sup> is lifted by J.L.<sup>1</sup> at *a*, it sinks at *d*, and depresses the heald shaft to which it has been connected. As to S<sup>2</sup>, it is lifted by J.L.<sup>2</sup>, the blade of which has been elevated by the upper rocking bar of the jacquard. It will be noticed that, in this case, the jacks under the healds rise at the opposite ends to what they do when a shaft is depressed. The object of this class of shedding motion is apparently to raise the shafts by a series of levers, but that of the American invention is to attain the same result by a system of pulleys. As to which is the most advantageous method is, no doubt, a debatable point. One would almost be inclined to suppose that there would possibly be more strain and friction, if not more power required in driving, in a loom constructed on the latter principle. Instead of *lifting* and *sinking* the shafts in this loom, they are *drawn* up and down by a number of pulleys. Thus, there are no fewer than three pulleys to each heald—two for elevating, and one for depressing, purposes. These are arranged within the framework of

\* All rights reserved.

the loom, and are what may be termed fixed, or stationary, pulleys. This principle of raising the leaves may be forcibly illustrated by passing a cord over a pulley rigidly fixed at any convenient height. Let one end of this cord be held in the hand some distance from, and also some distance above, the pulley, and a weight attached to the opposite end. The hand may now be supposed to represent the harness jack (which in this loom both lifts and depresses the heald), and the weight the shaft. Now, if the former were drawn backward or away from the pulley, it would necessarily lift or rather elevate the weight, and this is exactly the kind of mechanical arrangement adopted in this machine in raising the healds. For example, a strap, in mounting the loom, having been, in the first place, attached to the upper portion of the jack lever, is then passed over the pulleys, and fastened to the top of its proper heald shaft, so that when these levers are pulled backward by the gearing of the machine, they elevate the leaves as required. Possibly, it will now be advisable, before proceeding to give a detailed description of the manner in which the various parts of this dobbie are brought into communication with the harness or shaft mounting, to describe each piece separately, with its particular function in the machine. The necessity for adopting this course will be obvious, when it is stated that none of the parts are similar to those in the ordinary motion previously alluded to. Thus, there is neither spring, needle, rocking bar, jack lever nor blade in this loom, the following parts performing their work:—Cylinder gears, vibrator levers, vibrator gears, connectors and harness jacks. Steel rods and bowls, risers, or rolls, also take the place of the lags and pegs.

1. **THE CYLINDER GEARS.**—These correspond, in their relation to the other parts of the machine, with the knives in the English loom; the upper cylinder elevating, and the lower cylinder depressing the healds. One-half of the circumference of these gears is in the form of a cog wheel, and hence they have been called toothed cylinders. They are arranged so as to regulate the healds, boxes, and picking motions, and are made in such a manner that the section which operates the harness is adjustable, admitting of the healds and boxes being made to start at different times, or the former, a little in advance of the latter, in order that the shed may be changed previous to the picks or shoots of weft being driven home. This is a considerable improvement to a loom constructed on the open shed principle, because, in such a machine, the lay or batten leaving the piece before the shed has been altered by the engine, the pick or thread of weft last inserted is very liable to spring or fall back, this constituting one of the main causes why looms shedding on this principle do not generally admit of such heavy weftings as the closed shedding motion. The difficulty, however, is satisfactorily overcome in this loom by simply adjusting the harness and box gears on the cylinder to start operating on the vibrators at different times. Of course, it will be understood that, whenever the toothed section of one cylinder is changed, it is necessary to make a similar alteration in the other.

2. **THE VIBRATOR LEVERS, VIBRATOR GEARS, AND CONNECTORS.**—These, in reality, being connected together, form one piece. (Fig. 2.) The vibrator lever performs the same functions as the needle in



FIG. 2.—B. Vibrator Lever. C. Vibrator Gear. E. Connectors.

This Fig. shows the position of these pieces when the shaft is elevated.

the ordinary dobbie, receiving the bowl (i.e., the peg) of the pattern chain, and the vibrator gears to the jack blade, while the connectors communicate motion to the harness jacks. One very important and notable feature about the vibrator gears is the mode in which they, in combination with the cylinders, operate upon the shafts. No doubt, it would be observed that, when transmitting motion to the healds by a series of levers, strain and tension were applied very suddenly to the warp, and also as suddenly withdrawn, but the special characteristic of this motion is that the strain on the warp is slight and easy when the shafts commence to move, augmenting until the shed is fully formed, or until the vibrator gears have reached the centre, when the strain gradually decreases to the other extreme of the motion. As these gears are constructed on the crank principle, the greatest speed is in the middle of the throw, the commencement and terminus of the motion being gradual. Thus, supposing the lower cylinder engages the vibrator gear, it carries it forward, tooth by tooth, until it has made one-half of a complete revolution, and lowered, by so doing, its harness jack and shaft. Fig. 2 is intended to show the manner in which these pieces operate. The vibrator gear C is rivetted on to the connector E at the point lettered *b*, and revolves on a small pivot or pin fixed in the lever at *d*, the latter moving on an iron bar at *a*. Hence, when the connector is drawn forward the vibrator gear revolves until the other extreme of the slot in its surface comes in contact with the iron pivot of the lever, thereby lowering the heald. The upper toothed cylinder then reverses its motion and causes it to assume its former position, drawing back, at the same time, the connector and harness jack, and thus raising the shaft to which the latter is attached.

(To be continued.)



## ORIGINAL DESIGNS.

We have been favoured with a design for a Linen Table Cover, which is given on our first plate. This very pleasing pattern is the work of Mr. J. G. Bowins, of Dow Street, Brunswick Street, Manchester. Mr. Bowins is a designer of great taste and of infinite merit, as is amply testified, not only by his present effort, but by other patterns which he has designed for this Journal.

We give a pattern for Stuff Dress Goods on our second plate. It has been specially designed for us by an experienced man, who is closely allied with this branch of the textile industries.

On our third plate we give a design for a Tapestry Fabric of a simple, but telling, character. There is scarcely an end to the uses to which a pattern of this kind can be put; still it is chiefly as a tapestry piece goods design that we commend it to the notice of our friends. It has been drawn by Mr. R. T. Lord, 97, Park Road, Bradford.

Those of our readers who are interested in the subject of Designing should see the Japanese Art Book, Japanese Design Book, and Encyclopædia of Design, particulars of which will be found on our fourth advertisement page.



## MONTHLY TRADE REPORTS.

**Wool.**—At the London sales there has been a good attendance, and biddings have ruled brisk, consequently, prices have been very firm, the tendency being to a rise. French and German firms have bought largely. The aspect of the sales has given a firm tone to the markets in the provinces. In Scotland, a steady business has been done during the month at firm rates, and in the Yorkshire districts, although the wools sold have been in small quantities to satisfy actual requirements, still, the markets have been characterised by a firm tone, and a hopeful feeling has prevailed.

**Cotton.**—An improvement has shown itself in this branch during the month, and inquiries and actual sales have been more numerous and in larger volume than for some time past. The demand for raw material has been above the average, and for yarns and cloth, some hopeful features have presented themselves. Spinners and manufacturers have secured rather better prices than have ruled for some months, but, generally, buyers fight very keenly before paying any advance in rates. Looms are now more fully engaged, and it only needs a little further improvement in the trade to set running those that have been for some time idle.

**Woollen.**—As has been chronicled for twelve months past, manufacturers of the better classes of worsteds, fancy tweeds, and other choice fabrics, have been having much the best of the trade, in this branch, in all districts where such goods are produced, and, judging by reports, the demand for fabrics of good quality is likely to continue. That for low quality tweeds has also been moderately good, whilst medium classes, in plain and fancies, have met with little attention, and manufacturers have found it a matter of difficulty to secure orders to keep their mills running full time. Prices for the higher and lower classes keep tolerably firm, but for medium fabrics, they have fallen slightly.

**Linen.**—Trade has fallen off during the past month and shows no signs of reviving before next year. In June, a fair business has been passing, and prices have kept up.

**Lace.**—Business in this branch has shown no improvement in any department. The curtain trade has been in the usual unsatisfactory condition that has characterised it month by month during the year. Prices for most goods have a tendency to decline.

## Is Trade Reviving?

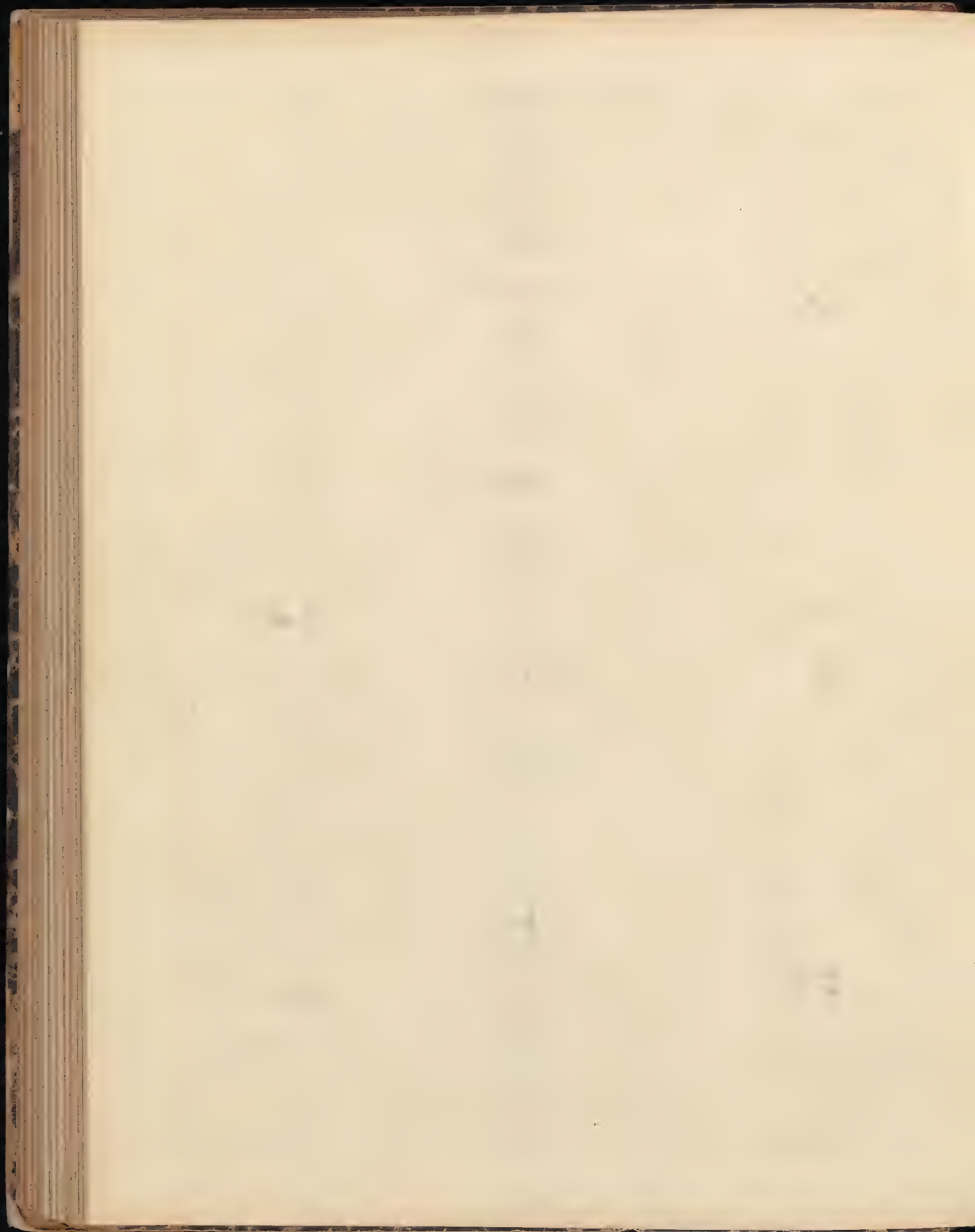
There can now be little doubt that the depression of trade which has existed for the last three years is coming to an end... The principal ground for the belief, held by the majority of observers qualified to judge, that the end of the depression has arrived, and that we are on the eve of a decided revival of trade, is the fact that a revival has already commenced in the United States, and is steadily becoming more marked. The causes of the improvement in the trade of the great Republic need not be dwelt on, as everyone is more or less familiar with them. Perhaps the most striking sign of the change of feeling among American men of business is the rapid reduction in the surplus reserve of the New York Associated Banks, to which attention has been called week by week in our City Article. That surplus reserve, it should be mentioned, consists of the excess of the total of specie and greenbacks held by the banks, over a sum equal to one-fourth of their net deposits. On August 1st, 1885, the total reserve was £32,100,000, and the surplus reserve £12,950,000. The reserve last Saturday was £24,540,000, and its excess £5,185,000. This remarkable change is, to a large extent, accounted for by the simultaneous rise in the total of the loans and discounts from £81,260,000 to about £68,000,000, and also by the arrangements entered into by the banks with the United States Treasury, whereby the latter lately received a large supply of gold in exchange for silver at the conventional par established between the two metals. As our readers may remember, this arrangement was made in order to insure the Treasury's being able to meet its gold liabilities, and the banks have, as they anticipated, had no difficulty in disposing of a considerable amount of the silver they took over to the public, an operation which the Government had been wholly unable to effect. Further measures of this kind will probably be found practicable, if the very natural uneasiness produced in the minds of business men by the continued existence of the Bland Act is removed by the repeal of that most unwise statute. Those who are best qualified to judge, are strongly of opinion that silver coins and silver certificates are likely to come into general use over an extensive area of the United States, as soon as the monetary policy of the Union has been definitely settled. The final adoption of a sound system of currency is likely to be hastened by the information which has by now been laid before President Cleveland and his Cabinet by Mr. Manton Marble, who, as mentioned by our Philadelphia correspondent some time ago, was sent to Europe to ascertain the state of opinion regarding the silver question prevailing in the leading countries, especially in England and in Germany. It is understood that he found that in Germany there is no disposition to abandon the policy adopted in 1873, and we need hardly say that in the United Kingdom he soon discovered that the bi-metallic party has no importance at all in proportion to the noise it makes. There are only two men of weight among the bi-metallists, and these are Mr. Henry Hicks Gibbs, who has very properly been placed on the Royal Commission to inquire into the Depression of Trade, and Mr. Henry Riversdale Grenfell. The remainder of the British silver party is not of much account, and Mr. Marble has, no doubt, reported this fact and its meaning to his Government.

Granted, however, as it now generally is, that trade in the United States is improving, there are some persons entitled to form opinions on the subject, who do not feel confident that a revival in America will produce a revival here, or, at any rate, not to the same extent as formerly. The reasons they offer for this view are founded on the fact that the people of the United States have so enormously increased their means of production of late years that they can supply themselves with all they require independently of foreign countries. Now, this is true so far as the mere possession of manufacturing plant goes. As regards iron and steel goods in particular, the United States is well able





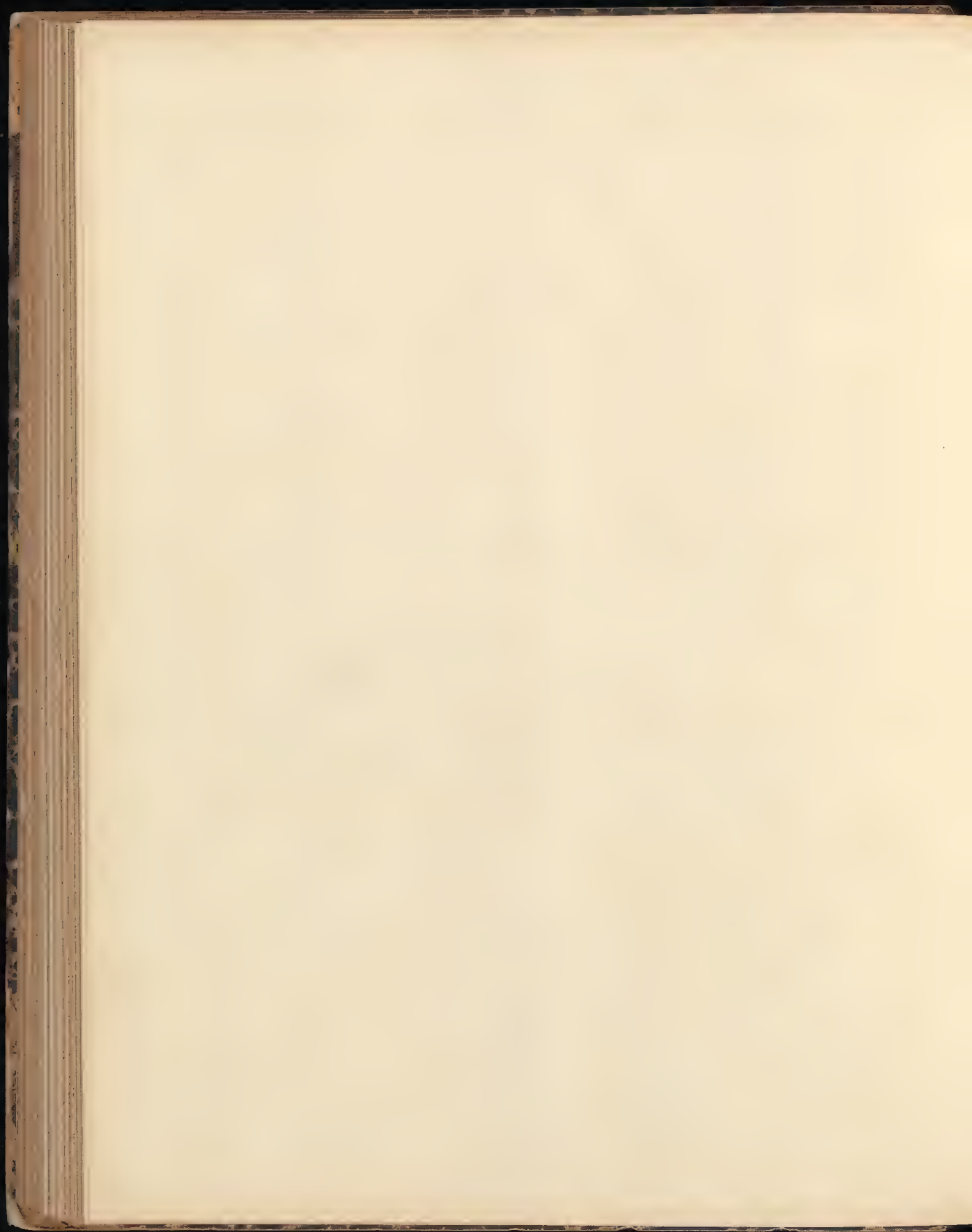
LINEN TABLE COVER.







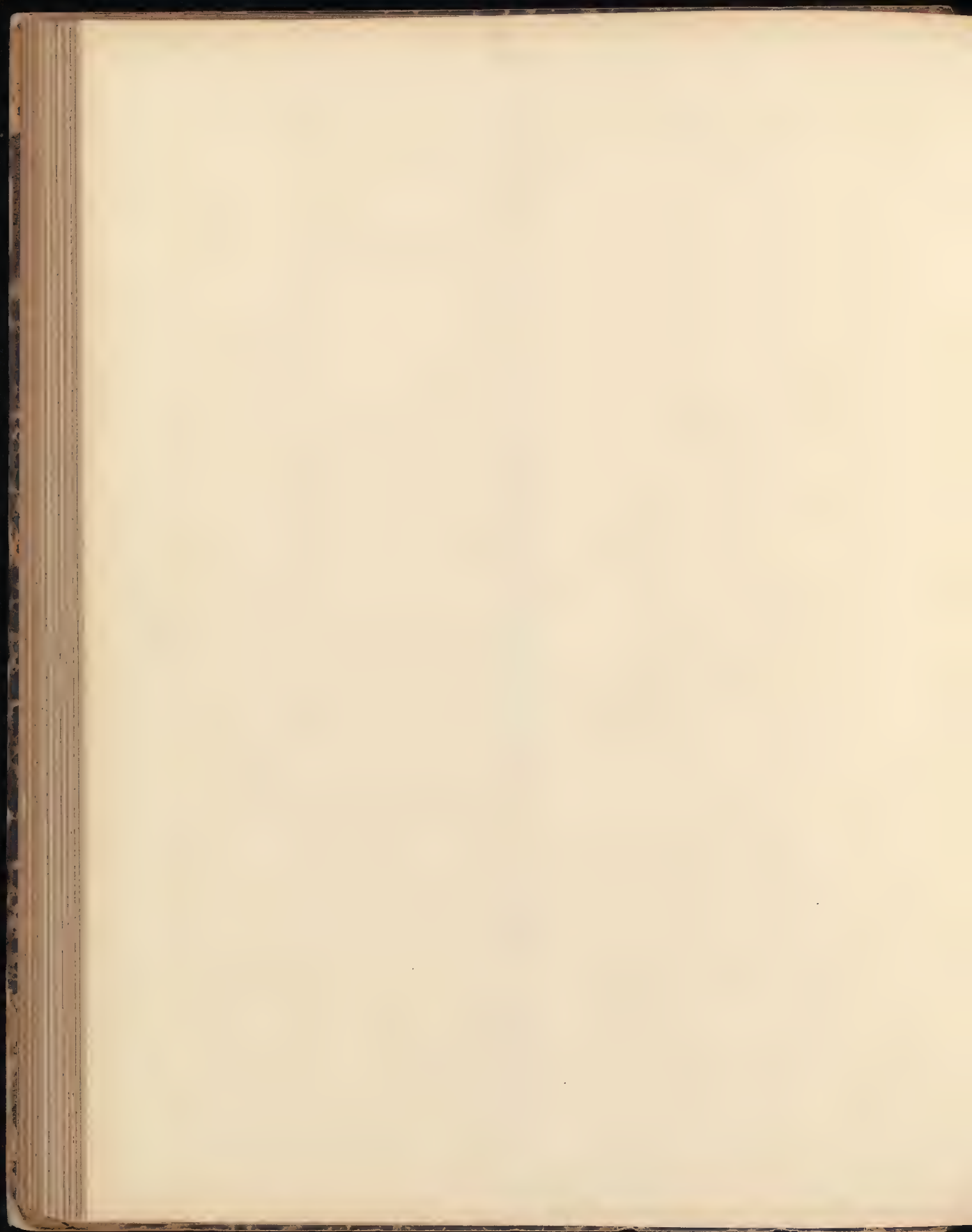
DRESS GOODS.







PAPERSTOCK





to supply itself, supposing that all that is needed for the purpose is a sufficient number of blast furnaces, foundries, forges, and rolling mills. But there is another most important factor in production, namely, labour. Now, of labour the American ironmasters have plenty when trade is good and wages high, but their men leave them when wages fall. American labour is at present to a large extent migratory. The men work at a trade while it pays them, with a will, but a large number of them are quite ready to turn their hands to something else in bad times, and they often abandon their old employment absolutely. The consequence is that the American ironworker, as well as the American cotton or wool operative, has rarely remained long enough in his trade to become a first-rate hand, and this explains the inferiority of much of the work turned out in the United States. This inferiority is probably increased by the existence of the protective tariff, which tends to make slovenly work the rule in all cases where the protection it affords from competition is effective. American railway engineers have been known to order British steel rails, costing, when the duty has been paid, several dollars more than American rails, in preference to the latter, their experience being that the foreign article is really the cheaper, being more durable, owing to superior workmanship. But the migratory character of American labour works beneficially for British capital and labour in another way. During a period of depression, an American mill or factory owner loses, or dismisses, many of his hands, and when trade revives, he cannot get them back. Even, supposing he can obtain enough labour, he recommences active work with a large proportion of new workmen, and they have to learn their trade. But the probabilities are that, in the first instance, a large proportion of the new orders for goods which suddenly come on the market when trade revives, will not go to American producers at all, but to British houses, since it is known that they will be able to supply what is wanted at once, or within the shortest possible time, while their American rivals cannot. British iron works and factories are like steam fire-engines, which stand with fire laid, water simmering over gas, and everything ready for service at a moment's notice. The American works cannot get more than a portion of the orders, because they are not in a condition to execute them at once. A moderate rise in prices in the United States will doubtless send orders over to this country by scores, and it will be many months before the American works will be able to take up all the business themselves. Cheering as the prospect is, however, our ironmasters and manufacturers will do well to remember that the situation is not one on which a big speculation can safely be based. A moderate rise in prices is all that can be expected, considering the enormous stocks held here and the number of furnaces, rolling mills, and forges ready to start into activity all over the world.—*From the Times.*

### The Dyeing of Textile Fabrics.

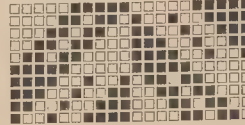
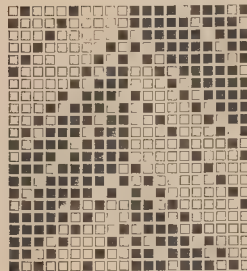
We have received a copy of "The Dyeing of Textile Fabrics," being one of a series of manuals of technology. The work treats in the most practical manner on fibres; operations preliminary to dyeing; water in its application to dyeing; theories of dyeing; mordants; methods and machinery used; natural, artificial and mineral colouring matters with their applications; dyeing of mixed fabrics and experimental dyeing. It contains close upon a hundred diagrams illustrative of the various subjects treated upon, and is altogether a work of hands of all students of technical institutes, and particularly of those directly interested in the dyeing trades. As an example of the class of subjects, and the manner in which they are treated, we extract the following on the bleaching of linen cloth. It gives an outline of a modern Irish process for 1,500 kilos. brown linen (lawns, handkerchiefs &c.), with low pressure kiers:—1.—Lime-boil: 125 kilos. lime, boil 14 hours; wash 40 minutes in stocks. 2.—Sour: hydrochloric acid, 2½ Tw. (Sp. Gr. 1.0125), steep 2–6 hours; wash 40 minutes in stocks; "turn hank," and wash 30 minutes in stocks. 3.—Ley-boils: 1st, 30 kilos. caustic soda (solid), 30 kilos. resin, previously boiled and dissolved together in water; 2,000 litres water; boil 8–10 hours; run off liquor, and add—2nd, 15 kilos. caustic soda (solid), dissolved; 2,000 litres water, boil 6–7 hours; wash 40 minutes in stocks. 4.—Expose in field 2–7 days, according to the weather. 5.—Chemick: chloride of lime solution, ½ Tw. (Sp. Gr. 0.0025), steep 4–6 hours; wash 40 minutes in stocks. 6.—Sour: sulphuric acid, 1 Tw. (Sp. Gr. 0.005), steep 2–3 hours; wash 40 minutes in stocks. 7.—Scald: 8–13 kilos. caustic soda (solid), dissolved, 2,000 litres water, boil 4–5 hours; wash 40 minutes in stocks. 8.—Expose in field, 2–4 days. 9.—Chemick: chloride of lime solution, ½ Tw. (Sp. Gr. 0.0025), steep 3–5 hours; wash 40 minutes in stocks. The goods are examined at this stage; those which are sufficiently white are soured and washed, and those which are not are further treated as follows:—10.—Rub with rubbing boards and a strong solution of soft soap. 11.—Expose in

field 2–4 days. 12.—Chemick: chloride of lime solution, ½ Tw. (Sp. Gr. 0.006), steep 2–4 hours; wash 40 minutes in stocks. 13.—Sour: sulphuric acid 1 Tw. (Sp. Gr. 0.005), steep 2–3 hours; wash 40 minutes in stocks. When the cloth (cream linen) is made of yarn already partially bleached, a less severe process is required, e.g., less lime is used in the lime-boil; only one ley-boil is given, and that with resin-soap instead of caustic soda; weaker chloride of lime solutions are used; the scald is effected with soda-ash solution; and operations 8 and 9 are omitted. What is known as "brown holland" is a plain linen cloth which has had little or no bleaching, but only a short boiling in water, or in weak soda-ash solution, followed by a weak souring. It possesses, therefore, more or less the natural colour of the retted flax fibre. The washing is usually effected in the wash-stocks, but sometimes, and with advantage too, in so-called slack-washing machines. The washing trough, however, is divided by wooden spars into several compartments, each capable of holding several yards of slack cloth between each nip. The "rubbing" referred to is a characteristic feature in linen cloth bleaching, and has for its object the removal of small particles of brown matter called "sprits." It is effected by a special machine which consists essentially of a pair of heavy corrugated boards resting on each other; the upper one is moved lengthwise to and fro, while the pieces are led laterally between them. The exposing of the goods in a field to the influences of air, moisture, and light, or "grassing," as it is technically termed, is still very generally adopted in order to avoid steeping too frequently in solutions of bleaching-powder, and thus to preserve as much as possible the strength of the fibre. "Turn-hanking" consists in loosening the entangled pieces and refolding them, so that every part may be exposed to the action of the hammers of the wash stocks; the operation is introduced as often as required at various stages of the bleaching process, but especially after washing in the stocks. A further very good example is to be found in the following remarks upon red colouring matters. These dyewoods are obtained from various species of *Casalpinia*. Their dyeing properties are similar, and owing to the fugitive character of the colours they yield, they are now employed in dyeing, only to a comparatively limited extent, chiefly for the purpose of modifying the shade of colours mainly derived from other sources. *Application to cotton.*—With aluminium mordants comparatively dull bluish-red colours are obtained. Work the cotton in a decoction of tannin matter, then in a cold solution of more or less basic aluminium sulphate. Wash and dye in a fresh bath at a low temperature, with a decoction of the dyewood. The stannic mordants yield brighter and more orange-toned reds. Scarlet may be obtained by mordanting with aluminium and stannic salts, and dyeing afterwards with the addition of some yellow colouring matter to the dye bath, e.g., old fustic. With iron mordants these dyewoods give violet-grey colours. By using a mixture of aluminium and iron mordants, and by adding a small proportion of logwood to the dye-bath, dark purple or "plum" colours are obtained. The colours are not fast to soap. The fastest are those in which the mordant is fixed by the aid of tannic acid. *Application to wool.*—In wool dyeing these dyewoods are generally employed along with other dyewoods, for producing brown colours, which cannot, however, be regarded as fast or permanent. The most useful mordant for wool is *bichromate of potash*. By mordanting with 3 per cent. of bichromate of potash, then washing, and dyeing in a separate bath, with small amounts of dyewood, a purplish-slate colour is obtained; with large amounts a claret-brown is produced. The addition of sulphuric or tartaric acid to the mordanting bath is not beneficial. The colour is thereby made redder. The addition of chalk or calcium acetate to the dye-bath is beneficial. A bluish-red colour is obtained by mordanting the wool with 6 per cent. of *aluminium sulphate*, and 5 per cent. of cream of tartar, then washing, and dyeing in a separate bath for ½–1 hour, at 80°–100° C. with 40–60 per cent. of dyewood. Still bluer shades (crimson) are produced by adding to the dye-bath towards the end of the dyeing operations a small quantity of ammonia. The addition of chalk or calcium acetate to the dye-bath is very beneficial; it makes the shade bluer and more intense. Brighter shades of red, more inclining to scarlet, are obtained by adding to the mordanting bath 1–2 per cent. of stannous chloride, and a small percentage of some yellow colouring matter, e.g., old fustic, flavin, &c. The addition to the dye-bath of skimmed milk or a solution of gelatin in moderate quantity is beneficial; it combines with and renders insoluble and inert the tannin matters present in the wool, thus enabling one to obtain somewhat brighter shades. The single bath method gives fairly satisfactory results, the colour being paler, but more brilliant than by the mordanting and dyeing method. Use 4 per cent. of aluminium sulphate, without tartar. Although the employment of *stannous chloride* as the mordant yields bright reds when it is used in small proportion (say 2–4 per cent. of stannous chloride with 4 per cent. of tartar), it requires the addition of too much tartar (30–40 per cent.) to give a really good colour. *Stannic chloride* also gives bright reds, but here, too, the amount of tartar required is abnormally large—use, say, stannic chloride equivalent to 4 per cent. of  $\text{SnCl}_2 \cdot \text{H}_2\text{O}$  and 32 per cent. of tartar. With tin mordants the addition of lime salts to the dye-bath is injurious. *Copper sulphate* as the mordant gives drab or claret brown shades, according to the amount of colouring matter employed. Use 4 per cent. of copper sulphate. The addition of tartar is not beneficial. The addition of calcium acetate to the dye-bath is only slightly beneficial. *Ferrous sulphate* as the mordant gives dark slate and claret. Use 2 per cent. of ferrous sulphate and 8 per cent. of tartar. The addition to the dye-bath of calcium acetate even to the amount of 40 per cent. is beneficial. *Application to silk.*—These dyewoods are now no longer used by the silk-dyer, having been entirely displaced by the coal-tar colours. They were formerly used for obtaining crimson shades. The ordinary method was to mordant the silk with alum, and to dye in a separate bath at a low temperature in a decoction of peachwood, with the addition of a little soap. Somewhat brighter and faster shades were obtained by working the silk afterwards in a bath containing nitro-muriate of tin, and finally washing. Bright crimsons were also obtained by mordanting the silk with stannous chloride and tartar, and dyeing afterwards with a decoction of peachwood. The work is published by Messrs Cassell and Company, Limited, London, and the author is Professor Hummel, F.C.S., Director of the Dyeing Department of the Yorkshire College.

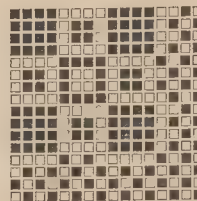


### Designs for Cotton Dress Goods.

No. 319. Cut White only. No. 321.



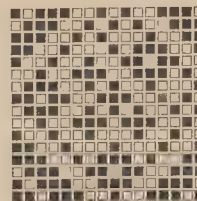
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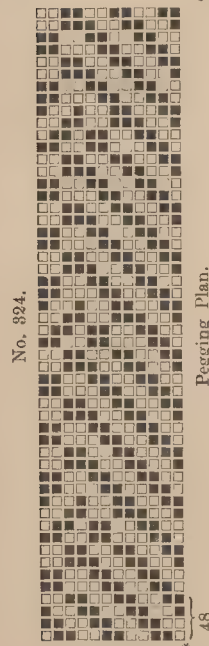
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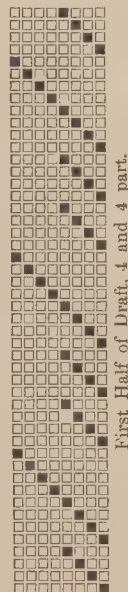
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### Cheviot Suitings.



Pegging Plan.



First Half of Draft, 4 and 4 part.



Second Half of Draft, 6 and 6 part.

\* Peg 48 on first 4 Lags as marked. 96 in Pegging; 96 in Draft.

### Warp:

6 Black  
6 Light Grey Mixture } 38  
6 Oak  
6 Light Grey Mixture  
4 Scarlet.  
6 Light Grey Mixture.  
4 Black.  
4 Light Grey Mixture.  
4 Oak.  
4 Light Grey Mixture.  
3 Black.  
1 French Blue and Light Green.  
4 Light Grey Mixture.  
4 Oak.  
4 Light Grey Mixture.  
1 French Blue and Light Green.  
3 Black.  
4 Light Grey Mixture.  
4 Oak.  
4 Light Grey Mixture.

### Weft:

Very Dark Sloe for Black.  
Cream for Light Mixture.  
Olive Brown for Oak.  
Crimson for Scarlet.  
Orange and Yellow Green for French Blue and Light Green.

### Warp and Weft:

150 yards per ounce single or  
300 " " twist.

980 ends.  
27 picks per inch.  
4 ends in a reed.  
33 1/4 inches wide in the loom.  
28 inches wide when finished.

First of pattern on first of draft  
and first of pegging plan.

96 ends in warp pattern.  
96 " weft "

No. 325.

13 Black.  
2 Plum Dark.  
1 Crimson.  
2 Plum Dark.

\* Design.

18 ends.

Warp as weft.

1258 ends.

37 picks per inch.  
4 ends in a reed.  
34 inches wide in the loom.  
28 inches wide when finished.  
Sharp Bright finish.

450 yards per ounce twisted hard.

### Saxony Suitings.

No. 326.

46 Black.  
4 Bottle Green.  
8 Black.  
4 Bottle Green.  
46 Black.  
4 Dark Brick Red.

\* Design.

112 ends.

Warp and weft 350 yards  
per ounce.

### Weft:

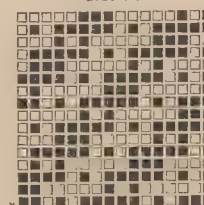
30 Black.  
2 Bottle Green.  
6 Black.  
2 Bottle Green.  
30 Black.  
2 Dark Brick Red.

72 picks.

4600 ends.

42 picks per inch.  
6 ends in a reed.  
72 inches wide in the loom.  
56 inches wide when finished.  
Melton finish.

No. 327.



\* Design.

### Weft:

64 Black single.  
2 Pale Blue 2-fold.  
2 Red Fawn "  
2 Black single.  
2 Black and Scarlet.

72 picks.

### Warp:

1 Black 2-fold } 48  
1 " single }  
1 Pale Blue 2-fold.  
1 " single.  
1 Red Fawn 2-fold.  
1 " single.  
1 Black 2-fold.  
1 " single.  
1 Black and Scarlet.  
1 Ruby single.

56 ends.

4490 ends.

68 picks per inch.  
8 ends in a reed.  
66 inches wide in the loom.  
56 inches wide when finished.

725 yards per ounce two-fold.  
375 " " single.



## Textile Industry in Turkey-in-Asia.

M. P. Savaya, Vice-Consul of France at Homs, has addressed the following report to the Minister of Commerce, accompanied by samples:—The manner of manufacturing and, in general, the kind of fabrics made, must, to all appearances, date from the greatest antiquity. All the looms employed are hand ones; the weavers, seated or half-seated, work on a warp stretched obliquely with weights. The comb used to close the weft is suspended perpendicularly, and is worked by the hand. The substitution of white and coloured English cotton yarns and the red yarns of Germany for the indigenous yarns, which were formerly exported from these countries into Europe, and the introduction of aniline dyes, are the only changes of any importance, introduced into this country for centuries. The town of Homs is one of the most important centres of the manufacture of Syrian fabrics, with Damascus and Aleppo. On minute inspection there are found to be 3,640 weaving-rooms. Besides these there are 410 looms worked by women and young girls in their own houses. These looms are divided as follows according to the kind of material for which they are employed:—Cotton fabrics—2,200 looms are employed in pure cotton fabrics, striped and coloured, and on scarfs, also striped, and called 'Tripoli.' These stuffs are known in the country under the name of "dima," of which there are annually manufactured 1,333,000 pieces, of the value of 17,290,000 piastres (3,362,264*fr.*). The value of the franc at Homa and Homs is 5 piastres 30 centimes. Each loom employs one workman, who makes two pieces per day, for which he receives 3 piastres per piece, which brings him the wage of 6 piastres (1*fr.* 18*c.*) per day. During the long summer days, skilful and industrious workmen succeed in making three pieces per day. Each factory, or union of looms in one place, has an assistant or apprentice to wait on the weavers, to whom is given, on an average, a half piastre per day, (9*c.*). Their number is about 500, almost all children from eight to twelve years of age, generally the latter. They are adepts at weaving, and can make a piece per day, for which they receive nearly the same remuneration as an adult. The raw material employed in making these stuffs consists solely of cotton yarns of European make. The manufacture of "dima" at Homs only occupied, ten years ago, about 400 looms. The rise in hand labour at Damascus and Aleppo towns, where richer materials are made, is the principal cause of this important increase. In England and Switzerland, attempts have often been made, but without success, to manufacture these fabrics, imitating the structure, colours, and folding. The cause of this failure may be attributed, no doubt, to the quality of the fabric itself, which, although more regularly woven by machinery, is less durable, and the dyes do not so well resist the frequent washings as those used by the native dyers. Cheapness, which is generally leading to the use of European colours, especially the anilines imported from England, France, and Germany, will soon do away with this point of superiority. Silk and Cotton Fabrics.—Under the name of "malass," the natives make a kind of gauze, for which 400 looms are employed, providing annually 60,000 pieces of an average value of 90 piastres the piece. The raw materials employed in making "malass" are white cotton yarns, No. 24, of English production, and silk from Antioch and Djebel Ansaria. The quantities of cotton yarns employed annually are 6,025 kilos, and of silk 18,205 kilos. The pieces of "malass" are sent out undressed; this operation takes place in Egypt before they are delivered to the retailers, in order to avoid the cost of packing in cases, instead of bales, which would be necessary if the goods were finished, and which would increase the expense of transport. We desire to call the attention of our manufacturers to the fabrics which might be made with advantage by machinery, and for which they would certainly find a market in Egypt, and even at Constantinople. To have a chance of succeeding, the dimensions of the pieces in use here should be adopted, and care should be taken that the fabrics can be washed without injuring the quality in any degree. It would be wise also to make inquiry as to the manner of folding the goods before they are delivered into the hands of the Egyptian shopkeepers. The fabrics called "Aladja" and "Hamdie," silk and cotton, employ 200 looms, manufacturing annually 30,000 pieces, of a value of 2,700,000 piastres, and employing about 4,807 kilos. of silk, and 16,025 kilos. of white, red, and

coloured yarns. The stuffs called "Aladja" in silk and cotton are in many coloured stripes, often resembling those of cotton called "Dima," the use of which is very ancient. The "Hamdie" have only been made here within the last two or three years. This fabric, silk and cotton plain, satin faced, has been a specialty of Hama, and here is the principal centre for the manufacture of this article. Two hundred looms are employed in making fabrics called "Cherchefs" and "Fontas" in silk and cotton, comprising divers kinds, but more particularly the large veils worn by women out of doors, large square bath towels, and sheeting. The women's veils employ the greater part of these looms; the common kinds are made with a cotton warp, dyed with indigo, and a weft also of cotton, with a few yellow silk threads. The all-silk fabrics comprise the following articles:—"Kauffies" or foulards for the head; Cherchefs or veils, richer than those named above; girdles called Tripoli girdles, coloured, striped, &c. The production amounts to 37,500 pieces, of the proximate value of 3,750,000 piastres. The country consumes about 5,000 pieces, and the rest are sold to the wandering people or sent to Hama, Aleppo, Damascus, and Egypt. The silk and gold fabrics, for which the workmen of Homs were formerly so renowned, are the veils for women—the "Bouffies;" the "Machlas"—gold and silk mantles for men, and the Arabian saddle covers called onaabie, &c., &c., materials employing now only ninety looms. The exportation of the silk and gold fabrics may be valued at 250,000*fr.*, the remainder is sold to the merchants of the place, and to the nomadic people. 250 looms make the wool and cotton materials used in weaving the "Abas Machlas," Arabian saddle covers, carpets for prayer, &c. Their annual production is 45,250 pieces, of about 849,056*fr.* in value, a value produced in great part by the Abas, broad striped mantles, white and black or brown, worn by the peasants and nomads, and by the Machlas, black or brown, which Europeans very improperly calls camels' hair fabrics. The warp of these fabrics is of English cotton, and the weft of native or European wool. Silk and gold fabrics, silk, wool, cotton and gold employ fifty looms, worked by fifty workmen, receiving a salary of 1*fr.* 5*c.* on an average, and 18*c.* the apprentices, per day. This industry, formerly very flourishing, has a tendency to cease altogether, as the high functionaries, the Cheiks, and the rich people of the towns of the interior have abandoned their luxurious clothing and the superb caparasons for their horses, which they used to wear. The value of the rich materials worn, often amounted to 1,500*fr.* to 2,000*fr.* per piece. The only opportunity the skilled weavers have of exercising their ability is through the orders received for Machlas and prayer carpets, destined for presents to influential persons at Constantinople. The rest of their time they occupy in making "Abas" silk and gold, or wool, generally with a red ground, which are still in demand by the well-to-do-peasants.

## The Parcel Post.

Parcels not exceeding 7 pounds in weight can now be received at any post office in the United Kingdom for transmission to the Cape of Good Hope (at the rate of 1*s.* per lb. to Cape Town, and 1*s.* 4*d.* per lb. to other parts of this Colony), including Griqualand West, the Orange Free State, and the South African Republic (Transvaal). Parcels will also be accepted, but at sender's risk, for Basutoland, Kaffirland, and other territories adjacent to the Cape Colony, except Natal. Parcels cannot at present be accepted for transmission to Natal, but arrangements for the extension of the parcel post to that Colony are in progress. The parcel post is already in operation to Gibraltar, Malta, Egypt, India (including Aden and British Burmah), the Straits Settlements, Hong Kong, Jamaica, Grenada, St. Lucia, St. Vincent, Tobago, and Trinidad, and is about to be extended to Ceylon and Labuan. The parcels will be forwarded to Cape Town weekly by the contract packets of the Union Steam Ship Company and the Castle Mail Packets Company, alternately.

The silk stuff trade in Berlin, enjoys this year a large sale, less on account of a change in fashion than of the depressed prices. The half-silk satins for dress made in Rhenish works on power looms have, on account of their cheapness, had a sale far surpassing expectations, though the profits made are influenced by the severe competition and the quick change of taste in regard to stuff, colour, and quality. In clothing stuffs, black all-silk materials are very popular, the soft satin-like texture as satin Duchesse, satin merveilleux, &c., being particularly inquired for. Half-silk ribbed stuffs with woollen weft have been sold in large quantities for mantles. Silk damasks, with large and small designs, as well as more or less finely-ribbed stuffs for children, have also had good sales.—*Kuhlows German Trade Review.*





### Means for Extinguishing Fire.

From "The Journal of the Franklin Institute," by C. JOHN HEXAMER.

(Continued from Page 58.)



**VERTICAL PIPES.**—I do not think much of the outside vertical, or, as they are sometimes called, Palmieri pipes, which are run along the outside of buildings, extending to the roof, the intention being that, in case of fire, the Fire Department will attach the engine to the lower end and the hose to the connection on the roof. It has, however, been demonstrated by experience, that, with few exceptions, as in the case of a few very high buildings, firemen prefer to carry their hose on their ladders to the top of the building, and such are, therefore, of little value in case of fire, as firemen will not use them. Inside stand pipes or vertical pipes, on the contrary, are of great importance. These should be connected with tanks of large capacity or with good force pumps, so that strong pressures may be obtained in them at all times, as the pressures of the City Water Departments, especially on higher stories, are inadequate. We frequently, in our Philadelphia Specials, find vertical pipes connected with the City water supply, which, on being tested, will throw a stream of not more than ten or fifteen feet. Care should be taken to place all vertical pipes away from exposed positions. These pipes should never be placed along walls exposed to the wind, as, in winter, the cold will cause the water to freeze and burst the pipes, the arrangement becoming worthless. They should always be placed in positions which will be least apt to be destroyed by fire, and which, in case of fire, will be least exposed to flames and smoke. Fire-proof stairway houses are well adapted for this purpose, as firemen in them are able to fight the fire until the last moment, for they know they still have a fire-proof way of retreat, and can, at any moment, protect themselves by closing the fire doors which lead into the stairway house. Vertical pipes should be of ample size, so that the requisite amount of water can be drawn from them. A good pressure in it is the pre-requisite of an efficient stand-pipe.

**HYDRANTS.**—In the ordinary hydrant, the water is at all times contained in it. In order to keep the water from forcing into the upper portion of the hydrant, which is apt to deteriorate it, causing parts to corrode, several devices have been constructed, such as the Matthews and the Chapman's hydrants, in which the water is turned on by valves in the lower end of the hydrants, which is, therefore, eliminated from the upper parts of the plugs. A similar construction is used for our ordinary fire plugs. The name, "fire plug," is derived from an English expression, and in its original appellation is entirely correct. An English plug is a device for reaching water, in the following manner:—the main water supply, running along the street, is punched with holes at various parts, and these are closed by wooden plugs, tightly driven in. On the top of these a box is fitted, which is filled with manure or straw, in order to keep the water from freezing. In case of fire, the fire department must first remove the manure or straw, knock out the wooden plug, and make connection with the opening, and pump the water from the pipe. Plugs of this kind are still used, to a certain extent. It was through the admirable labours of the father of a Vice-President of this Institute, Mr. Frederick Graeff, that plugs were first invented and introduced into our city and throughout the United States, and their introduction has now become general in every civilised country in the world.

**VALVES.**—Only straight valves should be used for turning on water. Mr. Woodbury states that he found, in a number of experiments made by him at Holyoke some time ago, that a two-inch globe valve reduced the pressure from 80 to 40 pounds per square inch. A valve or hydrant, which is not water-tight, on being closed by hand, without great effort, is to be deprecated, and should never be employed, as it is liable to break, on account of the excessive strains applied to certain parts when it is opened and closed. Jenkins and Chapman's straightway valves can be recommended. It is absolutely necessary that all valves in a factory should open in one direction only. I have frequently found that even the same factory contained valves which opened in different directions. It is no wonder, therefore, that mistakes are made, especially when people are highly excited as in case of fire. In order to overcome this difficulty, valves should be labelled with an arrow, and the word "open" painted on it conspicuously, so that any person, even unacquainted with the valve, may be enabled to open it properly. It is an unfortunate coincidence that, even among mechanics and engineers, the words right-hand and left-hand valves do not have the same significance. In some parts of the country the word "right-hand" signifies the motion of the hands of a clock, while in other districts, and used even by some persons in the same district, the term signifies the opposite. It would be well if conventions would take the matter in hand and settle the term once for

all. Chapman's gate, which was introduced some time ago, is a very good one, as it can be opened or shut by one turn of the hand to every inch diameter of the gate. For example, a six-inch gate is shut or opened by six turns of the hand wheel, &c. Further advantages for the gate are claimed:—"That it opens in the natural manner, advancing stem, full opening, with the utmost quickness of motion, without water hammer."

**HOSE.**—I prefer unlined linen hose for inside use even to more expensive kinds. Woodbury states that twelve samples from different manufacturers, weighing from three and three-quarters to four ounces per foot, burst when new, at pressures of from 420 to 650 pounds per square inch. Several experiments made by myself, with similar hose, gave even better results, bursting at pressures between 415 and 670 pounds per square inch; but it is only proper to state that the best samples were furnished me for the express purpose of testing, and may, therefore, have been of extra strength. In order that a hose shall remain in good condition, it must be kept dry, and should not be wound on reels. A hose, on a reel, after some time, on being unreeled, assumes a winding form similar to an Archimedeal screw, and when run off in a hurry, is apt to *hink*, and cut off the supply of water at times when it is most needed. Hose should be kept on a pin, and should be laid on with looping ends, as loose twine is frequently kept on a nail. The pin should be protected with a round, broad saddle or back, so that the hose may not crack, as it will when hanging on too sharp an edge. If hung properly on a pin, it may be drawn off without the slightest danger of *hinking*. It is absolutely necessary that uniform couplings should be introduced throughout, not only for regular fire departments, but also for factories. The old screw coupling labours under the serious disadvantage that, if a hose is not permanently attached to the hydrant, in the event of fire and excitement, it is difficult to attach the hose properly. For this purpose Jones' patent coupling, which is now used in most of our public fire departments, is excellent, as the hose may be quickly attached, even by excited persons. Care, must, however, even in this simple coupling, be taken to press the joints together tightly, as complaints are often made by incompetent persons that the joints leak. If they are put together properly, no leakage will occur. In the ordinary Jones' coupling, the rubber strip, which forms the tight joint, extends a short distance into the coupling, and, therefore, to a certain extent, retards the flow of the water and reduces the pressure, it has been claimed by some, as much as 20 per cent. Clay's coupling, in which the rubber strip does not protrude into the opening, or water way, is an important improvement, as it does not retard the velocity or pressure of the stream. A great advantage with the Jones' coupling is that, with an increase of pressure, up to about 300 pounds to the square inch, the joints become tighter, and are, therefore, less liable to leak.

**NOZZLES.**—I still prefer the old leather nozzle, with a metal tip, to the long metal nozzles, which are now much used. A leather nozzle may be bent in all directions, which one of metal cannot be, and as in fighting fire it is very frequently necessary that the fireman shall stand behind a projection, and direct the stream by bending the nozzle without exposing much of his body to the heat and flames, the importance of short metal nozzles or leather nozzles is evident. Morse's monitor nozzle is an important invention, as, by simply turning a crank, the nozzle may be turned in any position and held there. The so-called "spray" nozzle is a new and valuable invention, as it is frequently impossible for firemen to see, on entering a burning building, on account of smoke, sometimes created by insignificant fires, which it is impossible to detect for some time, on account of the smoke generated. The spray nozzle produces a fine spray, which precipitates the smoke around it, giving the firemen an opportunity to see and follow up the fire. Drip couplings are good for places in which the hose is attached to hydrants at all times. They consist of couplings with small openings or slots in the bottom, so that any contained water, or water created by the leakage of valves, will not reach the hose (and which would deteriorate it), but will escape through the slot before reaching the same.

Pressure at Hydrant. Pounds per sq. in.	Discharge per minute. Gallons.	Distance reached by jet.		Pressure at Hydrant. Pounds per sq. in.	Discharge per minute. Gallons.	Distance reached by jet.	
		Horizontal feet.	Vertical feet.			Horizontal feet.	Vertical feet.
15	84	54	26	55	165	118	88
20	98	62	35	60	172	125	93
25	112	72	45	65	180	132	101
30	122	80	52	70	186	139	106
35	132	88	60	75	193	145	111
40	140	96	67	80	199	150	116
45	149	103	75	85	205	156	121
50	157	111	80				

The above table, taken from the excellent work of Mr. Geo. A. Ellis, serves as a basis for estimating the diameter of distributing mains, for the passage of water through them, and is found for 100 feet of rubber hose and one inch smooth nozzle.

**TANKS.**—Tanks should be of large size, even larger than is usually thought to be sufficient. They should be provided with an overflow valve, and the contents should not be allowed to freeze. This can be prevented by passing an exhaust steam pipe through the tank, or by



mixing the water with salt, which will, at the same time, prevent the formation of organic slimes, which are objectionable. The tank should be in a position least exposed to the cold north winds. An alarm valve should be introduced in the tank, which gives an alarm, either by whistle or bell, whenever the water falls below a certain height in the tank. A better arrangement is an automatic electric alarm, which can be put in connection with the office of the superintendent, and gives the alarm there whenever the water falls below a certain height in the tank, being at the same time a tell-tale on the engineer in charge of the pump. Tanks should always be placed on the strongest part of a building, and on that part which will be apt to stand longest in case of fire. A fire-proof stair-way house, well sheltered from the flames of the surrounding buildings, is an excellent position.

### To Calculate the Size of Pulleys.

The first thing to determine is the diameter and width of face of the driving pulley, and the larger it is in diameter, the less face it will require, it is best to make the diameter as large as can be done conveniently. Having determined the diameter, the next thing will be to find the proper width of face. To do this, multiply the diameter of the driving pulley, on the machine that is to be driven, by its width of face, and this by the number of revolutions the machine will make per minute; then divide the product by the product of the diameter of the pulley on the driving shaft multiplied by the number of revolutions it will make per minute, which will give its width of face in inches (if the diameter has been taken in inches). Therefore, if the driving pulley on the machine is seven inches diameter by four inches face, and makes 700 revolutions per minute, then  $700 \times 7 \times 4 = 19,600$ , which, divided by the product of the diameter of the driving pulley multiplied by the number of revolutions, viz., thirty-six inches, making sixty-seven revolutions, is  $36 \times 67 = 2,412$ ; then  $19,600 \div 2,412 = 8\text{ins. } 126+$ , which is the face of the driving pulley. This supposes a countershaft, as the above pulley would not be large enough to give the machine the proper speed, and it would have too much face. To determine the speed of the countershaft, add the number of revolutions of the driving shaft and of the machine together, and divide the product by four, viz.,  $67 + 700 = 767 \div 4 = 191.75$  revolutions of the countershaft. The speed of the driving pulley multiplied by its diameter, and the product divided by the speed of the countershaft, gives the diameter of its counterpulley, viz.,  $67 \times 36 = 2,412 \div 191.05$  equals 12ins.  $.584+$ ; and the speed of the machine multiplied by the diameter of its driving pulley, and the product divided by the speed of the countershaft, will give the size of the counter-pulley, viz.,  $700 \times 7$  equals  $4,900 \div 191.75$  equals 25ins.  $.55+$ . Then the speeds would be—driving pulley, sixty-seven revolutions; counter-pulleys, 700 revolutions; machine-driving pulleys, 700 revolutions. The size of pulleys would be—the driving pulley, 36ins. diameter and 8ins.  $.126$  face; the counter-pulleys, 12ins.  $.584+$  diameter, 8ins.  $.126$  face and 25ins.  $.55+$  diameter, 4ins. face; and the pulley on the machine, 7ins. diameter, 4ins. face.



Arrangements are said to have been made with local authorities by the Postmaster General for a frequent and regular test of the weights and scales in use at post offices, where private trade is carried on. This has arisen out of complaints having been made of instances of unjust levy of extra postage. Very few people think of checking a charge for excess postage made upon a letter or packet delivered, but if they made a practice of doing so, they might find that the overweight would sometimes barely turn the scale. There must, of course, be a line drawn somewhere, a packet is either under or over weight, and liable to a stipulated rate of postage, but where such fractional quantities have to be dealt with and the line drawn so fine, the turn of the scale should at least be given in favour of the letter. We ought to have some assurance, moreover, that all scales, not those alone which are in use where private trade is carried on, were periodically adjusted. And, for another little reform that would be of very great advantage to the public, without in any way injuring the department, we should look to have a tare allowed on parcels sent through the post. It would only take a small margin to cover the wrappings of parcels, and the allowance would be a very great convenience.

The antiquity of Trade Marks has been traced by a contemporary to be almost coeval with the industry of the human race. It has been found that ancient Babylon had property symbols, and the Chinese declare that they had trade marks 1,000 years before Christ. Gutenberg, the inventor of printing, won a law-suit about a Trade Mark, and the use of a distinguishing stamp was recognised by the English Parliament in 1360.—*Labour News*.

There is some prospect, it would seem, of an industrial migration from Switzerland to the States. One manufacturer of silk goods—and he is one of the largest in Switzerland—has already made experiment in a small factory of over 100 looms, which he has set up at Hoboken. With the result of this, he appears to be so well satisfied as to contemplate the erection there of from 400 to 450 additional looms, with a winding mill and dye works attached. Another firm, "the second largest in Switzerland," is looking out for a desirable location in America for a new factory. These particulars would make it appear as if Swiss silks would be likely to be "wiped out." But the paragraph, particularly when taken together with others that have recently appeared in American papers on Swiss industries, appears to have been written with a purpose. The purpose, too, is pretty evident from its concluding sentence, which runs: "Both these firms, however, are waiting to see what action Congress will take with reference to the tariff. If the duty, which is now 50 per cent., is left at that amount, or not reduced below 30 per cent., they will make the transfer of their works."

On Saturday a large company was present at the private view of an exhibition of rare Eastern and other embroideries at Messrs. Liberty's, East India House, Regent-street. These exhibitions seem to be becoming a regular feature of the winter season, and certainly it would be difficult to find a class of productions more beautiful in themselves or more worthy of being exhibited. The present display is rich in old Japanese, Chinese, Persian, and Portuguese work, as well as in the embroideries and other examples of needlework or weaving, on which the industry of the East is employed at the present day. Among the finest pieces from the furthest East are No. 42, a Japanese altar-cover of the 16th century; No. 39, a fine specimen of Chinese 17th century embroidery on a silk ground; No. 45, a set of three pieces of Imperial yellow satin, worked with the five-clawed dragon, and a set of Chinese temple hangings, heavy with gold. The Russian and Turkish objects are mostly smaller in size, but they are hardly less delicate. There are also numbers of fine pieces of old Goa work, made either by Hindoos under Portuguese direction, or by Portuguese who were influenced by the forms of Eastern art. These, as collectors know, are, in their way, as beautiful as any embroidery that exists. We may also call attention to a quantity of modern embroidery from Constantinople, made by the poor women who work under the direction of the managers of the Turkish Compassionate Fund.—*Times*.



### Receiving Orders.

Kellett, E., 55, Tib Street, Manchester, upholsterers' manufacturer.  
Thorpe, J., 64, Friday Street, London, lace manufacturer.  
Tong, J., Earlsheaton, Dewsbury, Yorkshire, blanket manufacturer.  
Ward, W. E., 17, Cooper's Factory, Roden Street, Sneinton, Nottingham, lace manufacturer.

### Adjudications of Bankruptcy.

Cook, H. H., W. S. Cook, and H. Hepworth (trading as Cook, Hepworth and Co.), Toronto Street, Leeds, Yorkshire, woollen manufacturers.  
Field, W., and J. Field (trading as W. and J. Field), King's Head Yard, Huddersfield, fancy woollen manufacturers.  
Scarth, J. G., Bruntcliffe, Morley, Yorkshire, woollen manufacturer.  
Ward, W. E., 17, Cooper's Factory, Roden Street, Sneinton, Nottingham, lace manufacturer.

### Dividends.

Airey, E., G. Airey, and B. A. Airey (trading as Airey, Sons & Co.), Victoria Mills, Brighouse, Yorkshire, silk spinners, 1s. 6d., Offices of the Trustee, Townhall Buildings, Halifax. Separate estate of G. Airey, 20s., and of B. A. Airey, 20s.  
Northrop, I., 1, Cater Street, Bradford, Yorkshire, worsted coating manufacturer, 2½d., at the Offices of Colefax and Hamer, Public Accountants, Daily Telegraph Buildings, Bradford.  
Wilson, W., sen., and W. Wilson, jun. (trading as Wilson and Eyre), 53, Gresham Street, London, silk merchants, 6½d., Messrs. Joseph Andrews and Co., 7 and 8, Ironmonger Lane, London.

### Dissolutions of Partnership.

Barrowclough, A., and W. Smith, Leeds, Yorkshire, cloth manufacturers.  
Caldwell, W., and W. Clarke, Loughborough, Leicestershire, hosiery manufacturers.  
Dewhurst, J., I. Dewhurst, and J. Farrar, Elland, Yorkshire, worsted spinners.  
Bullock, W., and G. Baggs, 409, Oxford Street, Middlesex, silk agents.  
Haycock, C. F., and S. Dobson, 4, Huggin Lane, London, stuff merchants.  
Lyons, F. M., and F. I. Lyons, 123A, Wood Street, London, warehousemen.  
Tyler, A., and W. G. Mills, 41A, Mosley Street, Manchester, grey cloth commission agents.

## PATENTS.

## Applications for Letters Patent.

An aerated bleaching liquor for linen and apparatus therefor. J. Apsley and E. Lumb, London.  
 A vacuum or rapid low temperature drying tenter for drying blankets, &c. E. Walker, Heckmondwike.  
 Bumper for power looms. H. Marsden, Manchester.  
 Bobbins, tubes, spools, for first processes of cotton spinning, with machinery for making the same. J. W. Wilson, Barnsley.  
 Curtains and dress flounces woven in imitation of lace. J. Edelston, Manchester.  
 Compressing into shape the packets of hackle gills previous to scouring. G. Worrall, Dundee.  
 Centrifugal oilers for oiling loose pulleys, &c. G. B. Ross, Manchester.  
 Connecting jacquard cards. G. Broadhead and J. R. Hancock, London.  
 Combined safety governor and alarm sight feed lubricator for steam and compressed air engines. B. Law and C. W. Pinkey.  
 Chain clips for cloth stentering and finishing machines. W. Craig, Glasgow.  
 Cop winding machines. J. Cooper, Glasgow.  
 Cop winding machines. R. B. Thomson, Glasgow.  
 Cotton and other fibrous materials. J. C. W. Stanley, London.  
 Carpets. W. Fawke and F. B. Fawcett, Kidderminster.  
 Counterpanes, quilts, toilet-covers, &c. J. Lindley, London.  
 Dyeing or treating woven fabrics. Sir Titus Salt, Bart., Sons and Co., and Titus Salt, London.  
 Dyeing silk, wool, &c. W. R. Lake, London.  
 Dupe head making machine. Messrs. Milner, Bradford.  
 Dobby apparatus for looms. E. Wilson, London.  
 Detent for spinning spindles. R. N. Cottrill and J. M. Hetherington, Manchester.  
 Eccentrics for twist cotton and woollen presses. J. Bradbury, Manchester.  
 Embossed fabrics. M. Conrath, London.  
 Fastening the ends of tapes for driving the spindles of spinning machines, &c. J. Briggs, Halifax.  
 Fastening tapes for spinning fibrous material, to be used also for belt fasteners. T. H. Brigg, Bradford.  
 Folding and measuring fabrics. W. H. Hacking, Manchester.  
 Fast and loose reed looms. J. Marshall, London.  
 Fringing or edging toilet covers, &c. J. Lindley, London.  
 Fabrics in bobbin-net or twist-lace machines. R. A. Matthews and W. Birks, London.  
 Grooved pulleys. W. Picken, Birmingham.  
 Heddle apparatus of looms. F. B. Fischer, London.  
 Heald regulating machines. D. Crabtree and T. Fairburn, Bradford.  
 Imparting stripes of colour to the selvages of velveteens and other fabrics. E. Weild, London.  
 Lubricating the working parts of dabbing brushes. J. Clough and J. C. Walker, London.  
 Lace fabrics in twist lace machines. E. Cope, London.  
 Looms for flowered fabrics. J. M. Collins, Glasgow.  
 Lubricators. J. M. Leowin McMurtrie, Glasgow.  
 Looms for plain and fancy weaving. A. Wright and E. Firth, Bradford.  
 Lace in twist lace machines. A. Lees, London.  
 Looms for looped fabrics and terry velvets. J. Clegg, Manchester.  
 Letting off motions for looms. C. Fox and P. Crossley, London.  
 Lubricating bearings. E. Edwards, London.  
 Measuring and winding sheets of cloth, &c. C. Herold, London.  
 Method of and apparatus for treating cotton, &c., so as to produce a greater amount of softness or flexibility. E. H. Hargreaves, Manchester.  
 Means of attaching straps to pickers and picking sticks in looms. G. Howe, Manchester.  
 Manufacturing textile belts. M. Gandy, London.  
 Method and means of winding and weighting yarns on brass bobbins used in lace machines. W. and W. T. Martin, London.  
 Opening and cleaning or scutching fibrous materials. S. Crighton, Manchester.  
 Oil cups or lubricators. A. Quiggin, Liverpool.  
 Preparing, spinning, doubling, twisting and winding cotton, &c. H. Stevenson, J. Webb and S. Hallam, Manchester.

Pickers for looms. D. Roebuck, London.  
 File cutting. H. Bottomley, Bradford.  
 Power looms. H. E. Newton, London.  
 Preparing fibres. G. Little and T. C. Eastwood, Halifax.  
 Preventing shrinkage of fabrics during the crabbing, boiling, dyeing, &c. J. Leeming and O. Ingham, Halifax.  
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 Weavers' shuttles. J. Waddington, Bradford.

## Patents Sealed.

12,375	14,581	14,597	14,695	8,831	14,162	14,662
15,678	6,209	8,124	8,149	9,065	9,074	13,594
13,844	13,929	14,739	15,044	15,366	13,215	13,433
14,859	3,363	14,412	14,474	15,585	16,773	8,977
9,140	15,388	9,194	15,257	15,720	15,722	6,777
5,378	9,815	15,031	15,601	15,663	16,158	9,823
9,888	9,918					



# The Journal of Fabrics

AND

## Textile Industries.

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Calico Printing Styles	9	Original Designs for Dress Fabrics.
		The American Power Loom.

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### Prospects for Textile Goods in 1886.

(By our Special Trade Commissioner.)



AT the beginning of a new year, there is generally no little uncertainty prevailing as to the precise class of goods that is likely to be most in demand during its course. Many manufacturers have to stake the chance of what they are making turning out a success, in the instances of those goods which it takes a very long time to prepare, and they have frequently to base their calculations upon the chances of the last successful productions, that the public most inclined to, during the previous year, being followed up in a similar direction with certain modifications and improvements that it may occur to them to make. This may generally be regarded as a very safe rule, for, in the course of a season, there is some novelty or other that is sure to start up, which, being too late to be produced in any considerable quantity for that particular one, in which it made its first appearance, is yet a sufficient indication of the direction in which the taste of the public is disposed to assert itself. This is sometimes whimsically true, to the extent that even things,

which are not of an appropriate character for a succeeding season, are sometimes adopted and continued, fashion reconciling us to anything at times, however incongruous certain goods may be. To take a case in point, the Kyrle, or curled, wool has been a very leading feature during the past season in many fabrics amongst dress goods for women, and coats for men of a certain kind. This wool combination, making an irregular surface of a "furry" description, was of a very appropriate character for anything in the shape of winter goods, resembling Astrachan fur in many instances, yet would certainly not be in strict accord with the class of article that is supposed to be best adapted for spring or summer wear. Yet, the line or road being once marked out, in this direction, will cause many to follow it; and Kyrle wool will be essayed in new fabrics, in many directions, during the ensuing spring, with what results it remains to be seen, for here to a certain extent will be a violation of fitness, or the suitability of the article used for the season for which it is intended. Such variations, or departures, from the natural order of things, as it may be expressed, are, however, often tolerated and approved by reason of certain conditions of suitability for particular objects, as in the instance which may be frequently seen of young women wearing the small fur capes, that have been so popular in recent years, quite late on in the spring, at a time of year when furs are supposed to be laid aside: the reason for resorting to them being that they are at once light in weight, and yet so warm a covering for the shoulders, that the wearers find it very difficult to make up their minds to part with them. The experience of the last season will, however, give close observers, amongst leading salesmen, pretty fair indications of what are likely to take. In the dress-goods trade, there has been no great leaning to any particular style, or styles; the production of fabrics having been of the most varied order, and often of the most opposite character; checked Scotch tweeds of Aberdeen or Glasgow make selling side by side with the plain, thin, all wool dress goods of Roubaix, and it is only fair to assume that the same latitude will be extended to anything that may be brought out in early spring, or subsequently. The public have, indeed, shown themselves willing enough to take up with any vagary; some materials have been apparently fabricated by their makers with the object of seeing how coarse and open it would be possible to make a material, or how closely they could produce a resemblance to house-flannel. Some years ago, certain dress fabrics were always made and bought by the trade as a matter of course, such as an assortment of coloured, and tinted alpacas, and mohairs, as well as lustres, and similar makes of Bradford production. Leading "lines" were often specially aimed at, and all retailers could buy good parcels of them. Matters have, however, changed very much since then, and although a certain amount of alpacas, and similar fabrics, have been in demand of late, having been resorted to by the costume maker to blend with other materials, and also for use as wraps or overalls for ladies, as a universal fabric, they are no longer in request. In broad silks for dresses, although it has been hoped, by those mainly interested, that there would be a revival in favour of this, the most beautiful of all textile fabrics, the hope has been disappointed, and we seem as far off as ever from a return to the liberal use of silks for dresses. A great many mixed silk fabrics, such as chintz, unicorns, and various fancy materials, are likely to be wanted for use in conjunction with other fabrics, and to be resorted to by the costume maker, before mentioned, who is likely in the future to become an important factor in determining the class of styles that is ordinarily to prevail in women's dress. As a set off to this falling off in the silk trade, an increasing business is expected to be done in goods made of spun and waste silk, the efforts recently made in this way having proved eminently successful. A good trade may be anticipated, however, in various kinds of neckerchiefs, handkerchiefs, and different sorts of squares, in which a satisfactory degree of business has been already transacted. There is a feeling on the part of consumers for lace goods, but, unfortunately for the Nottingham manufacturer, a strong opposition has lately sprung up on the part of Continental makers in this branch, when, a few years ago, there was not nearly so much competition to fear. They suffered before from the competition in Yak laces, when these were sold to a very large extent a few years back; but now they have to meet with a very spirited opposition in thin silk laces, which have been

largely used for millinery purposes, as well as in the German-Swiss laces, and fancy cotton goods of all sorts that are now sent over to us in large quantities from abroad, the English trade with St. Pierre-les-Calais having largely increased of late, as well as a considerable business having been transacted during the past year in the Yak laces aforesaid, which have sold to a considerable extent, and have been largely used for trimming ladies' dresses. In prints, the prospects during the coming spring are said not to be as bright as they have been, for although there has been no lack of inventions, or of skill—master-pieces of calico printing having been turned out—the public are not so disposed towards the purchase of prints as they have been, though the printed sateen, which have been brought out are, many of them, extremely elegant and beautiful. There has been a wider field, too, for the exercise of the printer's art, in the representation of the many objects of animated nature, such as tropical birds, brilliant hued butterflies, and insects, which at one time Englishwomen entertained a great aversion to wearing depicted upon articles of apparel—an aversion which has been greatly overcome of recent years. This objection even extended to ribbons, when such an object as a many hued or yellow butterfly upon a black ground was often depicted with the most life-like fidelity, and made the most appropriate kind of neck ribbon that it was possible to have, according to French ideas, but were always sold with great difficulty in England, as ribbon buyers often found to their cost when endeavouring to dispose of them, such goods never being appreciated in this country to the extent their artistic merit deserved. There is thought to be a good opening for all the diversified classes of goods that figure as coverings for the shoulders, as fichus, lace capes, capes composed of fancy materials, and all the various shapes of a small size that can be made to do duty in place of the shawl, which is now discarded, so as to be in accord with the style of costume now in vogue, which needs not to be obscured, but set off by the aid of a top or upper article of dress, with which to finish off the whole. So far, nothing has been found to take the place of the little fur cape before alluded to, and to answer the same purpose so effectively. The principle, that better and cheaper fabrics are to be turned out from the employment of fine yarns or materials, than from coarse ones, where they can be ordinarily used, and admit of a choice, is gaining ground very fast amongst the textile manufacturers of the country, I am happy to say. The greater beauty and value of any article made from yarns of a high order, was always apparent enough, but its relative cheapness was not understood in many instances, the greater length of the skein of a fine and high class yarn counterbalancing the low price, and greater weight of an inferior one, to a great degree. A very conspicuous example of this truth came under my observation a good many years back (shortly after the inauguration of the "French Treaty") at Coventry, in the instance of black belt ribbons, when they were being sold in inch and a half and two inch widths. It had always been customary for manufacturers there, who made belt ribbons in conjunction with other classes of goods, to sort out thin, coarse silk, and lay it aside for employment in waist ribbons, where, of course, great weight was wanted, and, at first sight, this would appear to those who knew no better, to be only a reasonable disposition of the coarser counts, and method of proceeding. But one manufacturer there, at the suggestion of a manager whom he had engaged from Congleton, who was familiar with the use of fine weighted silk, and recommended the employment of Italian silk for warps, when it was considerably over 30s. per lb., made the attempt. The fibre was weighted and dyed bright, by Messrs. Dickens and Co., of Spring Vale, who were then the only dyers who did this class of work, with the result that very superior goods were turned out at prices that beat anything else in the market. The extra weight needed was made up by the cotton warp, which was well covered by the fine silk, while the edges were as regular and even as a die, and made tolerably rich. In one and a half inch width, these belts cost 15s. per piece, and the maker sold them at 16s. 11d. to the wholesale houses, and the principal belt maker at that time at Coventry, used to go about saying that the one who had made the successful departure was sacrificing his goods under cost price. Of course, he could not believe that he could be beaten. This indeed, is the real secret in the successful competition in

silk manufactures by the foreigner. They study their raw material, and know the history, so to speak, of every description of fibre. They have it thrown hard or soft to suit every requirement—so many turns to the inch—and leave no point overlooked. Bengal silk is often discarded by many, its soft nature being against it. But its diffusive quality can be brought into good play in making brocaded figures. Japan silk is not liked by many English manufacturers, it also partakes of a soft nature. But this can be made harder in the weighting process of dyeing black, and, on account of its fineness, a very economical article can be obtained to use, and for many years the silk agents of Coventry used to sell, to manufacturers there, the coarser portions of the bales of silk which Macclesfield and Congleton manufacturers and throwsters combined sent there for sale, using the fine portions themselves; and, at the time of which I am speaking, there was not a manufacturer in Coventry who fully understood the various points of the raw material with which he dealt. But this is a subject so large in itself, as to require separate treatment, but what can be done with a fibre under proper treatment, the case of Brutia silk needs only to be mentioned, which was, at one time, the very lowest-priced and most inferior in the market, but, from improvements at its source of origin, now takes rank with the best European silk, and is much appreciated in Nottingham for lace-making. It is still confidently predicted that the leaning of the public will again be in favour of bright effects and brilliant colourings, and that the season now beginning will again be an eminently fancy one.

### British Patents.—Important to Exhibitors.

Mr. Alfred J. Boulton, M.E., Fel. Inst. P.A., of 323, High Holborn, London, the Consulting Patent Agent of the American Exhibition, has furnished the following useful information in reference to the British Patent Law and its relation to persons exhibiting inventions in London. British Patents are granted for any new art, manufacture, or composition of matter, new combination of two or more known things, producing an advantageous result, chemical or other processes. No search as to the novelty of an invention is made, as is the case in the United States, though the examination is very strict as regards the extent of the term "one invention." But, as a rule, it may be considered that what is patentable in the United States is patentable in Great Britain; and that which would be accepted as subject matter for one patent in the former country would also be accepted here. To be new, the invention must not have been "published" in this country, that is, it must not have been made or become known to the public before the date of application for the patent. The fact of the original U. S. Patent being on view at the Patent Office Library before the date of application here, would be a legal "publication," and the same remark applies to the U. S. Official Gazette, should the particulars of the invention therein be sufficient, as it very often is, to enable the invention to be understood. When an exhibition has been certified by the British Board of Trade to be an Industrial or International Exhibition, an exhibitor may present his invention without previously protecting it; but if he intends to secure a Patent he must, before exhibiting the invention, give the Comptroller of Patents notice of his intention to do so. The notice must be accompanied by a description of the invention. The protection afforded by this means is, however, of a somewhat problematical description, as there appears to be no remedy in case of secret fraud. Thus an inventor exhibits at a certified exhibition, and a person sees his exhibit, and at once applies for a Patent; later on, the real inventor applies for a Patent, and finds himself forestalled, and, unless he can prove that the other person took the invention from him, he will have no redress. In these circumstances an intending exhibitor will adopt the safest mode of procedure by protecting his invention first, and exhibiting afterwards. The Government fees on British Patents, covering cost of provisional protection and complete Patent for four years, are £4 (\$20).

A new agricultural society has been started in Cape Colony, with the special object of improving the quality of Cape wool, which is certainly in great need of improvement.





## Parochial Assessment of Cotton and Woollen Mills.



N article upon the parochial assessment of cotton and woollen mills will not be out of place in a journal devoted to the interest of mill-owners, though, at the first glance, it may seem to be so. The number of spinners and manufacturers who are compelled to appeal against their assessment, as fixed by the different Boards of Guardians, seems to have so largely increased, and so many others exist who are still wrongfully assessed,

that a better knowledge of the Law of Parochial Assessment must be of no little value. The erection of new mills of the modern type has been the main cause of bringing this subject into prominence, and for this reason:—by the usual method upon which the basis of assessments is arrived at in most unions, no adequate allowance is made for concerns which, although of comparatively recent date, are not adapted for machinery of modern make. That assessments arrived at in this way are not in accordance with the law, we hope in this article to demonstrate. When a new mill, with all modern improvements, and built so as to suit modern machinery, is rated the same as a mill not so adapted, one result can only follow, viz.—that the concern, which can least stand any additional burden, has a further load thrust upon it. All mills, in considering this question, must be divided into two classes:—fire-proof and non-fire-proof mills, and it must be remembered that, in all our comparisons between mills of different ages, those comparisons are between mills of the like style of construction. The Acts of Parliament upon which the assessment of cotton mills is chiefly based, are 6 and 7, Will. IV. c. 96, and 25 and 26, Vict. c. 103. By 6 and 7, Will. IV. c. 96, it is enacted that “no rate for the relief of the poor in England and Wales shall be allowed by any justices, or be of any force, which shall not be made upon an estimate of the *net annual value* of the several hereditaments rated thereunto.” That is to say, of rent at which the same might *reasonably be expected to let* from year to year free of all usual tenants’ rates and taxes, tithe commutation, rent charge, if any, and deducting therefrom the probable average annual cost of repairs, insurance, and other expenses, if any, necessary to maintain them in a state to command such rent. This is the basis upon which all assessments should be made. We would point out that a mill, built so that all its floor space is available for machinery of modern make, would naturally let for a larger annual rent than one of the same actual floor space, but so built that modern machinery could not be erected therein, or, if so erected, only at the expense of wasting a considerable portion of the floor space. For an illustration of what we mean, a spinning mill probably furnishes us with the most obvious example. Consider a spinning room built with bays measuring 10 feet 6 inches, and one with 9 feet bays. In the former, a modern self-acting mule may be erected in each bay, whilst, in the latter, every third bay would have to be left empty, or, at any rate, only so far occupied as may be required for the creels of the mules situated in the bay on either side of the two bays containing a pair of mules. Were this not done, the mules would have to be of less stretch than is usually made, and the creels would have to be placed so close together that the work could not be properly attended to. To obviate this, one-third of the floor space of the room is lost, or, allowing for the extra bays gained by the bays being narrowed and, therefore, more numerous, a good fourth of the floor space is unavailable. Still, by the system at present employed by the valuers of the assessment committees in many unions, the assessment of one mill would be as much as that of the other, the floor space being equal, and the quality of the building, in other respects, being also similar. The mill with the 9 feet bays would not let for the same annual sum as the mill with the 10 feet 6 inches bays, and, by the law, should, therefore, be rated at less. When the occupier is a tenant, and not the owner, it is easy to ascertain the value of that occupation, by reference to the sum paid for it. But it is

not so easy to ascertain the value of the mill when in the occupation of the owner. As, however, the value of every matter is ascertained by its exposure to sale in the open market, it would be thought that the value of a mill which had thus changed hands, could be easily determined, but this is not so, as the assessment committees continually refuse to accept any such basis. We would note here, that in every case where the owner pays the rates on a mill, which he has let to a tenant, the amount of these rates should be deducted from the assessment. The following rule is an established one. That the assessment should be in proportion to the net rent which a tenant would pay, he discharging all rates, charges and outgoings. We need not enter very fully into the question of gross and nett rateable value. The nett value is arrived at by deducting from the gross value sundry allowances for repairs, insurance, &c., but here more anomalies exist. The allowance for insurance should be greater upon a non-fire-proof mill than upon a fire-proof one, and the allowance for repairs more upon an old mill than upon a new one. They are, however, all treated alike. Should the tenant pay the insurance upon the mill, this point may become of importance to him when the assessment is based upon the actual rent paid, and when the insurance premiums are high. Another point which should be noticed, and which may be of no little value to some of our readers, is that a mill should be rated at a less annual value, should it be depreciated in value from collateral circumstances, such as being in an unsuitable neighbourhood, liability of stoppage from floods—when driven by water, failure of water to drive the wheel, the vicinity of nuisances, having to pay extra charges for cartage, liability for the repairs of roads, or other matters calculated to injure the enjoyment of the property, or to depreciate its actual intrinsic value. Having touched briefly upon the different points of the law of parochial assessment as it now exists, we will proceed to consider how it is carried out in most unions. The surveyor is sent down, who measures the buildings and the land. The floorage is reckoned by measuring the outside of the walls, not the inside. The diameter of the cylinders of the steam engines, and the length of the stroke are also taken. The square yards of floorage, ascertained as above, is multiplied by so much, according to the class to which he considers the building to belong, and each union divides mills into three or four classes, and the H.P. supplied, to be ascertained from the diameter of the cylinders and the stroke, is also multiplied by so much per horse power, and the gross annual value is arrived at. Generally, no attention is paid to the heights of the rooms, so that a mill with rooms of an average height, are assessed at as much as one with rooms of above the average height. The greatest anomaly exists, however, in the assessment of the horse power. An old mill, with old engines, and old boilers, by this system, is assessed at more than double the amount, so far as the power is concerned, that a mill which has boilers working at 90lbs. or 100lbs. pressure, and high speeded engines, would be, and yet, the latter mill would let at a far higher annual rental than the former, for the very obvious reason that it could be worked at a far less expense of fuel. Since the assessment made by the Board of Guardians is taken as the basis for County, Local Board, or Corporation Rates, besides sundry Government Taxes, notably the Income Tax, (under one of its sections,) it is obvious that a high assessment must entail a considerable loss. In prosperous times, when the concern is being worked at a profit, an excessive assessment does not cause any loss, so far as the Income Tax is concerned, as long as the profits earned are greater than the assessed annual value of the mills, as the amount paid for Income Tax, under this head, may be deducted, and will be allowed off the returns of the profits made. But in these bad times, when many concerns, and, notably, those which are old-fashioned, are not making money, Income Tax on the annual value of the property still has to be paid. The Government seem to act upon the idea that, if a man owns a mill, he is bound to make profit equal to what the mill would let at in fairly profitable times, and that, if he does not do so, it is very wrong of him, and that he should therefore be made to pay all the same. This is a principle which has no sort of right in it—rather too much of “heads I win, tails you lose,” to be just. The Income Tax people being, by this means, sure of a return from all property, however bad trade may be, whether that return is earned or not. Sure of a return to the uttermost



farthing, when trade is good, and when trade is in that condition that no one could be found to rent the mills, had they only to work them during the then existing depression, they are still sure of a return, which the owner has to pay out of capital. The great amount of trouble that a mill owner is put to when he appeals against an assessment, and the unfavourable surroundings which tend to hinder anything like a proper pleading of his cause, make all most reluctant to have to appeal, and consequently, many, rather than do so, submit to the injustice. To be kept waiting in badly ventilated and crowded rooms, or in cold and draughty passages, for two or three hours, and then to be requested to take a seat in the corner of a room, which contains a table, around which a number of gentlemen are seated, with no room on the table for any documents which the gentleman who is appealing may require, is not conducive to justice being done to the case of the spinner. Nor do the further proceedings savour of English justice. The case is probably adjourned for the union valuer to examine the mill—and after another period of waiting at the union offices, the spinner is again admitted into the presence of the committee. The spinner states his case as well as he can, and is then requested to retire. The surveyor's report is then read in the spinner's absence, and the committee arrive at their decision; being, in fact, judge and defendant all rolled into one. In some cases, if the spinner objects to the valuer's valuation, as being contrary to law, he is shortly told that "that is their method of valuing mills,"—"that it may be arbitrary, but that, if he is not satisfied, he can appeal to Quarter Sessions." In many cases the Quarter Sessions are appealed to, and the claim is allowed, but the trouble, cost, and annoyance, are so great that it would seem as if the system were purposely intended to enable the assessment committee to do as they like. Were mill owners to join together in order that they might obtain redress in this matter, we fancy complaints, on the score of unduly high assessments, would become a thing of the past.

### Manipulation of Yarns in English Cotton Mills.

#### WHAT THE FOREIGNER THINKS OF IT.

Director Matitsch, of the Vienna Textile Technical School, in a lecture, held on March 6th, 1885, before the Technical School of Lower Austria, stated that of late cotton yarns had been received from England, the fabrics woven from which had caused great difficulty in bleaching. The dulness of the white produced had been attributed in turn to neglect on the part of the different parties who had handled the material, until it was discovered that the fault lay in the yarn being manipulated by the spinners for gain in weight. The discovery was brought about by the catch-bar in a loom refusing to operate. On examining the combs, they were found to be clogged by a greasy paste of fragments of fibre and graphite, and an examination of the yarns worked upon the loom proved that they contained an abundant quantity of tallow, which in 24-2s and 30-2s could be discovered by the smell. Soon, several looms were found in the same condition in Mr. Matitsch's establishment, and a thorough cleaning of the combs was required; this occupied four men, three days at each loom thus overhauled. After boiling the rest of the English yarn with soda, the trouble did not occur again. Mr. Matitsch, thinking it interesting to determine the quantity of tallow contained in the yarn, boiled a bundle of 10lb. yarn for five hours in distilled water, and, after cooling down, separated the fat floating on the top, and melted it with 100 grm. beeswax. By repeating the experiment with another 10lb. bundle, he obtained two cakes of respectively 248 and 261 grm. which, besides the 100 grm. wax, contained 148 grm. and 161 grm. tallow respectively. Not satisfied with this experiment, as the tallow had not apparently been completely removed from the fibre by the boiling in pure water, Mr. Matitsch boiled a 10lb. bundle of 40-2 yarn for three hours in a solution of soda, had the yarn then rinsed, and the rinsing water being added to the soda boil, the mixture was heated and common salt added, to obtain an insoluble soap, from which the fat was separated by boiling with dilute sulphuric acid. The fat was melted several times over with 100 grm. wax added to it, and, finally, a cake was obtained which weighed 412 grm., containing, therefore, 312 grm. tallow, or 7.87 per cent. of the weight of the yarn.



### Important Points to be Watched in the Process of Cotton Spinning.

That the cottons to be mixed together should on an average be of the same length of staple, the same colour, and much the same strength. Where a long fibre and a shorter fibre are mixed together, the yarn produced will be uneven, and there will also be a greater amount of waste, made at the different machines, than if they had been of the same length of staple. In cotton, where the length of the fibre is uneven, the longer fibres will, in every case, tend to throw out the shorter ones.—*Scutching*.—In the scutching department, care should be taken that the blades of the beaters are set to the feed rollers in accordance with the length of the staple to be operated on. The edges of the beater blades should be kept sharp and smooth, otherwise, artificial nep will be formed, and the cleaning operation will not be so satisfactorily carried out. Where the beaters are set too close to the feed rollers, the fibre is apt to get broken or ruptured, and the strength of the yarn spun from it is, thereby, impaired. Weak cottons require less scutching than twist. The fanner dust pipes should be well looked after to prevent choking up, and should allow of a clear draught from the cages.—*Carding*.—In carding engines, the filleting, while being put on, should be held at an even tension throughout. For lickerins, saw tooth fillets are most suitable for nearly all classes of preparations. In setting a card, the lickerin should be placed as close to the feed rollers as possible, without touching the cylinder, similarly to the lickerin and the doffer to the cylinder. The points of the wire should never be allowed to get dull or blunt, but should be ground, by a perfectly true emery roller, as often as may be required, to put on a sharp edge. The stripping operation should be carried out two or three times a day, so as to keep the wires from getting clogged up by the short fibre and the impurities which the cotton contains. The carding should never be heavier than is actually required to keep up the supply for the succeeding machines, as, the lighter the carding, the better the quality obtained.—*Combing*.—In combing machines, the needles in the top combs and cylinders should always be kept in good condition, and never be allowed to work when broken or hooked. The cylinders should be cleaned about once in every four days, and the combs cleaned and set throughout about once in every three months. The per centage of waste taken out of the combs should be watched very carefully, and no more allowed to be removed than is actually necessary. Have the cushion plates always in good order, never allowing the leather to be cut or torn without immediately removing it. The web, as it leaves the detaching rollers, should be free from dirt, with the fibres thoroughly straightened and laid side by side. If it looks cloudy or nappy, the setting should be at once looked to. If it looks curly, instead of being straight and level, some of the detaching rollers are at fault, and should, therefore, be immediately attended to. A bad leather roller should never be allowed to work, but, should be immediately replaced with a new one. As in carding, the lighter the combing, the better the production.—*Drawing*.—In drawing, the drafts should not be too great, nor the revolutions of the rollers too quick, as the sliver is apt to become ratched. Where loose boss rollers are in use, they should be kept well oiled and free from dirt. The stop motions at the back and the front of the frame should not be allowed to get out of order, otherwise singles and irregularity in the yarn cannot be avoided. Have the flats, or clearers, that cover the rollers, cleaned sufficiently often to prevent the flat waste from gathering and being carried through with the good material. The flutes of the rollers should be kept sharp, and the setting suited to the length of the staple of the cotton to be used. This is done by means of periodical scourings.—*Stubbing, Intermediate, Roving, &c.*—The twist imparted to the sliver in each of these processes should only be sufficient to admit of



it winding off at the succeeding operation without breaking. Hard twist means, not only less production, but also, inferior drawing at the next operation. The winding on of the rove on the rollers should be proportioned to the length delivered from the roller. If the circumferential velocity of the bobbin at any part of the process exceeds that of the delivering rollers, then the rove must of a necessity be ratched, weakened, and made unlevel. With regard to the rollers and the drawing process, the same remarks are applicable as those made under "Drawing."—*Spinning.*—The spinning mule should be well attended to if good yarn is to be obtained. The carriage should always be kept well set, and the points of the spindles at an equal distance from the bite of the roller along its entire length. Where this is not attended to, the yarn will be snarly. The "copping" is another point of great importance. In the building of a cop, the bottom should not be too short or too long, the body should be of an equal thickness throughout, and the "nose" well tapered. The building faller should be set a certain distance from the spindle collars, which should be the same at any part of its length. The quadrant must be so regulated as to wind the yarn on at an equal tension throughout the inward traverse of the carriage. The check band should never be tight, except just as the carriage touches the stops, or the drag on the inward run of the carriage may be too great. As regards the rollers, the same remarks are applicable as given under "Slubbing," but the attention in the mule must be greater. In a roller beam, where none of the rollers are weighted but the front row, care must be taken that their ends or points do not get choked up with waste, otherwise the yarn is sure to be ratched. In piecing the broken threads, bad and dirty joints are very often made, which can easily be avoided on the part of the operative. Slubby, soft, and dirty ends should never be allowed to run on to the cop, but should be broken immediately, as they appear. In doffing a full set of cops, the fingers should be placed tightly against the spindle and the very bottom of the cop, and then raised up. In any other way, the bottoms will be readily drawn out, and the cop spoiled. The drafts in the roller beam should be as moderate as possible, and, where possible, especially in fine yarns, double roving should be used, as, thereby, greater uniformity and regularity in the yarn produced is assured.—*Cotton Factory Times.*

### The Worsted Dress Goods Trade.

#### GOOD ADVICE TO MANUFACTURERS.



THE "Bradford Observer," in its yearly report on the dress goods trade, gives some sound practical advice to manufacturers in Bradford, which will apply equally well to producers of figured fabrics in other textile districts. It runs as follows:—"As regards the piece trade, the year has been one of depression, followed by a considerable fall in prices, and consequent loss to manufacturers and merchants, but especially to the latter, who, holding stocks, have to submit, in a falling market, to inevitable loss. It has been the experience of merchants that, upon placing their repeat orders, they could always buy cheaper than at the last rates, and this went on without intermission for the first nine months of the year, since when a slight stiffening in some qualities of wools had made, as it were, a halt for the time being in the falling of prices. Whether this will continue, we cannot tell. But we are inclined to take a hopeful view of the situation, and for the following reasons:—First of all, the demand for English wools, speaking generally, has overtaken the supply. This remark, however, must not be understood to include lustre sorts, which have been less inquired for. This being so, we are inclined to think that prices will be maintained for some time to come, as the fashion for the harder, crisper-handling character of goods has become more and more pronounced. This change in the fashion has, however, been the means of producing a fall of from 15 to 20 per cent. in the softer makes of goods, such as cashmeres, &c., and holders of these stocks have been very heavy losers. This fall has been much accentuated by the cheapness of French goods, the prices of which have come

down in a short time in a ruinous manner. The French manufacturers have sold an enormous quantity of their fabrics in England for next spring season, not because their goods are more desirable than ours, for, as we have pointed out before, the fashion has completely changed off these soft makes, but simply because their prices are so low. In many instances, all-wool goods have been sold at a price only fractionally higher than that at which the Bradford manufacturer produces cotton and wool fabrics, besides being in appearance much smarter and finer. Whether they will be sold at a profit by the merchant, and whether they will supersede our own makes of goods, remains to be seen, but we are distinctly of opinion that the million will still prefer our useful cotton warp fabrics, which wear well. Complaints already begin to be heard regarding the tenderness of these cheap French goods, which give way at the seams and elbows. In low priced goods, Bradford has maintained, and will continue to maintain, her position. With certain exceptions, she has never aimed at making high priced articles, and the appreciable differences in the fall of values between French goods and our own is much in our favour. There can be little doubt that the great bulk of the French materials to which we are referring as being sold so cheaply in the English markets this season, and more especially those sold for the next, must entail a heavy loss to the French manufacturer. The explanation is suggested by the earlier experience of our own trade, and must be sought for in the change of fashion. In France, producers have just done what we in Bradford did some years ago, when everybody was of opinion that black alpacas, mohairs, and lustrés would be required for ever. When the orders for this class of goods became fewer and fewer, manufacturers here still went working on, and accumulating stocks which have taken them years to dispose of, and then only at ruinous prices. Similarly, French manufacturers went on making their class of goods, notwithstanding the falling off in the demand, until their stocks grew to be enormous. At last, realising this fact, they made an effort to get rid of the goods they ought never to have made, and have taken almost any prices to effect sales. But learning his lesson sooner than we did in this town, the French manufacturer made up his mind that the change had come, and already is in the market with goods made out of our English wool and mixed with Botany. But here we are on level ground, and at a fair comparison can hold our own. Whilst the Frenchman is quick to seize an idea, and thoroughly original in producing and making a "fashion," we in Bradford are much slower, and wait to know what the public want before producing it, thus, as it were, putting the cart before the horse. This is a lesson we are continually learning, but do not take very readily to heart. The present taste will illustrate the Frenchman's adaptability and quickness. Early in this year, our spinners were very busy in making loop yarns for France and the Continent, yet, notwithstanding the fact that yarns of which to make high novelties were being sold in large quantities in our very midst, we were not alive to the requirements of the times, until the Frenchman appeared on the scene with elegant bouclés, made from this Bradford loop yarn, and had already taken large orders at high prices, yielding large profits, before we in Bradford found out why our goods were not selling as freely as they ought, and why so few repeat orders were coming in. Now, when we go into the matter and realise what is wanted, we can meet the market just as well as our French competitor, and at much lower prices. But he has got the profit out of the novelty, and we have to be content with smaller profits. What we want in Bradford is more independence, originality and foresight, not to sit down contentedly, just because for the time being our machinery is well employed."

In Vienna, they recently exhibited gas and water service pipes made of paper. The same kind of pipes will do for many factory purposes, for laying electrical wires, &c. The pipes are made as follows: Strips of paper are taken, the width of which corresponds with the length of one pipe section. The paper is drawn through melted asphalt, and wound upon a mandril which determines the inner diameter of the pipe. When the pipe thus made has cooled, it is pulled off the mandril, and the inside is covered with a kind of enamel, the nature, of which, is kept secret by the makers. The outside is painted with asphalt varnish, and dusted over with sand. It is stated that such a pipe will resist some 2,000 pounds internal pressure, though the thickness of the stuff is only about half an inch.





## ORIGINAL DESIGNS.

On our first page will be found an elegant design for a Table Cover, drawn specially for us by Mr. George Lees, Commercial Buildings, Kidderminster. The purposes for which this pattern are suitable are manifold. For a Linen Table Cover it will be readily accepted, as also for a Tapestry Cover, such as those so much in use for occasional tables, if produced in appropriate colours.

Our second plate consists of two designs for Dress Fabrics, full particulars of which are given on page 7. Since the introduction of the larger class of designs, upon point paper, into our pages, we have received communications from some of our subscribers, which show us that this is a step in the right direction. And, therefore, we have no hesitation in continuing. We may, here, add that we are always glad to receive suggestions and expressions of opinion from our readers, not only with reference to our designs, but upon any feature of our journal.



## MONTHLY TRADE REPORTS.

**Wool.**—At a meeting of the Importers' Committee, it was decided to open the first series of the London wool sales on the 19th inst. About 220,000 bales will be offered. English wools have sold rather more freely during the past month, and prices have shown a slightly hardening tendency. There is, however, much wool on hand, and buyers, at the close of the month, did not operate to any great extent, preferring to await events in the new year. Colonial wools, being very cheap, have sold fairly well. Spinners have been kept busy on contracts, and for new orders have asked advanced rates. There has been a fair demand for 2-fold yarns. The export branch seems to have been the most active, but still the home trade is fairly good. Manufacturers have booked more orders than is usual in the last month of the year, but at prices that have been cut very fine. Unfortunately, they stand in an unenviable position, as they have had to give extreme prices for yarns, and, on the other hand, have not been able to secure a proportionate advance for goods. The home trade has improved a little during the month, as has also the American business, whilst for the Continent not much improvement has been perceptible.

**Cotton.**—The markets have been mostly quiet, very little new business having been done. Yarns have fallen slightly in both demand and price, with some few exceptions, and what inquiries have been made have resulted in little or no business. Manufacturers have been better employed, but on old orders that are not yet worked out, and have preferred to wait until the new year before generally taking orders at prices that have been offered. The export trade to India, China, and Persia seems to be looking up, judging by the numbers of inquiries from merchants. The finer makes of goods have met the most demand, and some extensive orders have been booked at rather better rates.

**Woollen.**—This branch has not given out much new business during the month, although manufacturers of the better and lower qualities of goods have been fairly busy on old orders. There is generally a falling off in this branch towards the close of the year, as stock-taking becomes the rule. Hopes are entertained of an improvement in trade during 1886. In the Scotch district, some good orders are to hand for home account, but for export, little has been done, the foreign tariffs being much against the class of goods manufactured.

**Linen.**—This industry has not improved in any respect; there has been a falling off in trade in many kinds of fabrics, and what new orders have come to hand, have been in very small lots. The home trade, during the month, has been below the average, whilst for export, it has been moderate. In unbleached linens, the production considerably exceeds the consumption, and prices have, consequently, been much affected. In the Barnsley district, a fair business has been done recently in figured cloth of a low quality.

**Lace.**—This branch has been very quiet, but an impression seems to prevail that the stagnation that has affected some departments for so long a time cannot last much longer, and hopes are entertained of an improved trade in 1886. Curtains, Antimacassars, &c., have had a moderate sale, but have only been produced in small quantities, and much machinery for this class of goods has been idle. More inquiry has been made for loop laces, and also for ruchings and frillings, but prices have ruled low.

## Stains on Sized Cotton Cloth.

At a meeting recently held in Manchester, a paper was read by Mr. Watson Smith, lecturer in chemical technology in the Victoria University, on "The grey or faint violet stains frequently appearing on sized cotton cloth." This paper was one of considerable practical importance for manufacturers of grey cloths, sizings, and cotton spinners, and consequently dealt with a subject of peculiar local interest. Being requested by a large Manchester firm to investigate the precise causes and conditions of the formation of these stains in the grey cloth manufactured by the firm, and designed for Chinese and other markets, the essayist had discovered that the faint violet grey stains in question, which usually run along the warp threads, are due to the action of the minute quantities of tannin in the small fragments of shells of the cotton seeds, which adhere to the warps, on the iron contained in these warps, as well as in the materials of the size, with which the warps are treated at a boiling temperature, in the sizing process. Why the Chinese or other Eastern nations should reject sized grey cloth because of these stains, which are usually so faint as only to be seen when the cloth is illumined by a top light, and are easily removed with the size itself by the first washing with a little soap and soda, is not easy to understand, unless, as is very probably the case, the stains are mistaken for mildew in its incipient stages. The remedy suggested was some addition to the cotton-spinning machinery of such a kind that the warp threads shall be completely cleaned from all minute residues of seed husks. The fact of the intermittent character of the occurrence of these stains was referred to, and the expense, as well as the anxiety and the trouble, caused by them. One manufacturer might be suffering from them, another might be exempt, though at another period, without warning or apparent explanation, the trouble might come upon the last, who would then suffer as his neighbour had done. To throw further light upon this question, a special investigation would be required, and Mr. Watson Smith offers to undertake it, if the various buyers will supply him with cotton-seeds from cotton of various growths and countries. He would determine what amounts of tannin are contained in the cotton, and to what extent these amounts vary. Precise conditions being ascertained, more suitable steps could then be taken towards the application of a remedy.

## Book Notice.

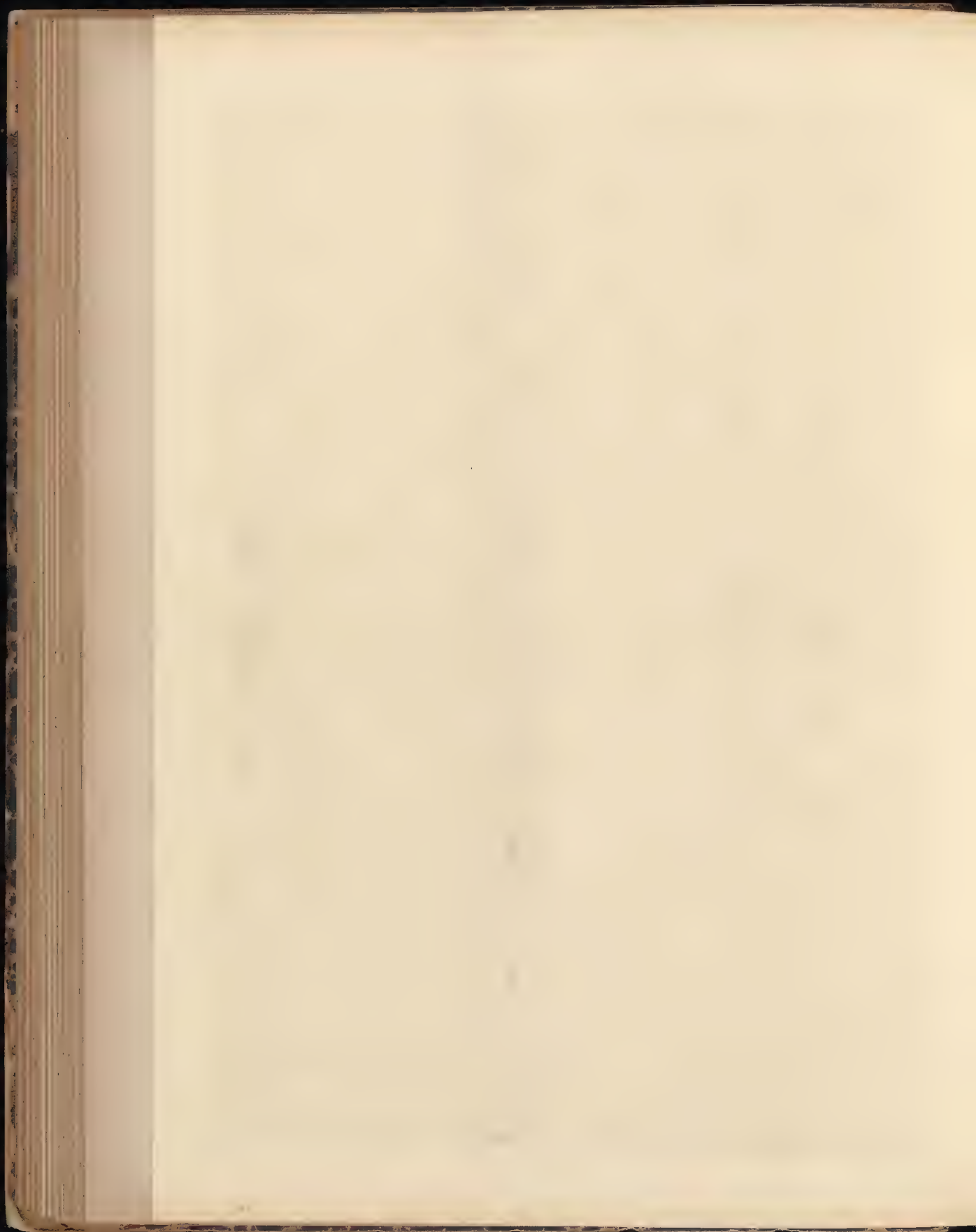
"Future Careers for our Sons and Daughters at Home and Abroad." Published weekly. J. P. Segg & Co., London.

The first number of a weekly publication, bearing the title of "Future Careers for our Sons and Daughters at Home and Abroad," has been sent us for perusal. It is intended to deal, from week to week, with every profession, trade and occupation, systematically; to give every detail concerning each channel of employment which can by any possibility be practically useful to those anxious to fix upon the walk in life most suitable to the needs and aspirations of themselves or of those dear to them. The issuing of such a work is a new feature in continuous publications, and will, undoubtedly, be welcome to all classes of society, and if future issues come out of the press in as practical a form as the number now before us, it will meet the hearty approval of a large circle of subscribers in the different walks of life. The first issue contains some admirable articles by writers who evidently thoroughly understand their subject, and impart the information and advice in a clear and practical manner. We wish the publishers of the work every success, and are sure that the step they have taken will secure benefit, both to themselves and to a large section of readers, at home and abroad.





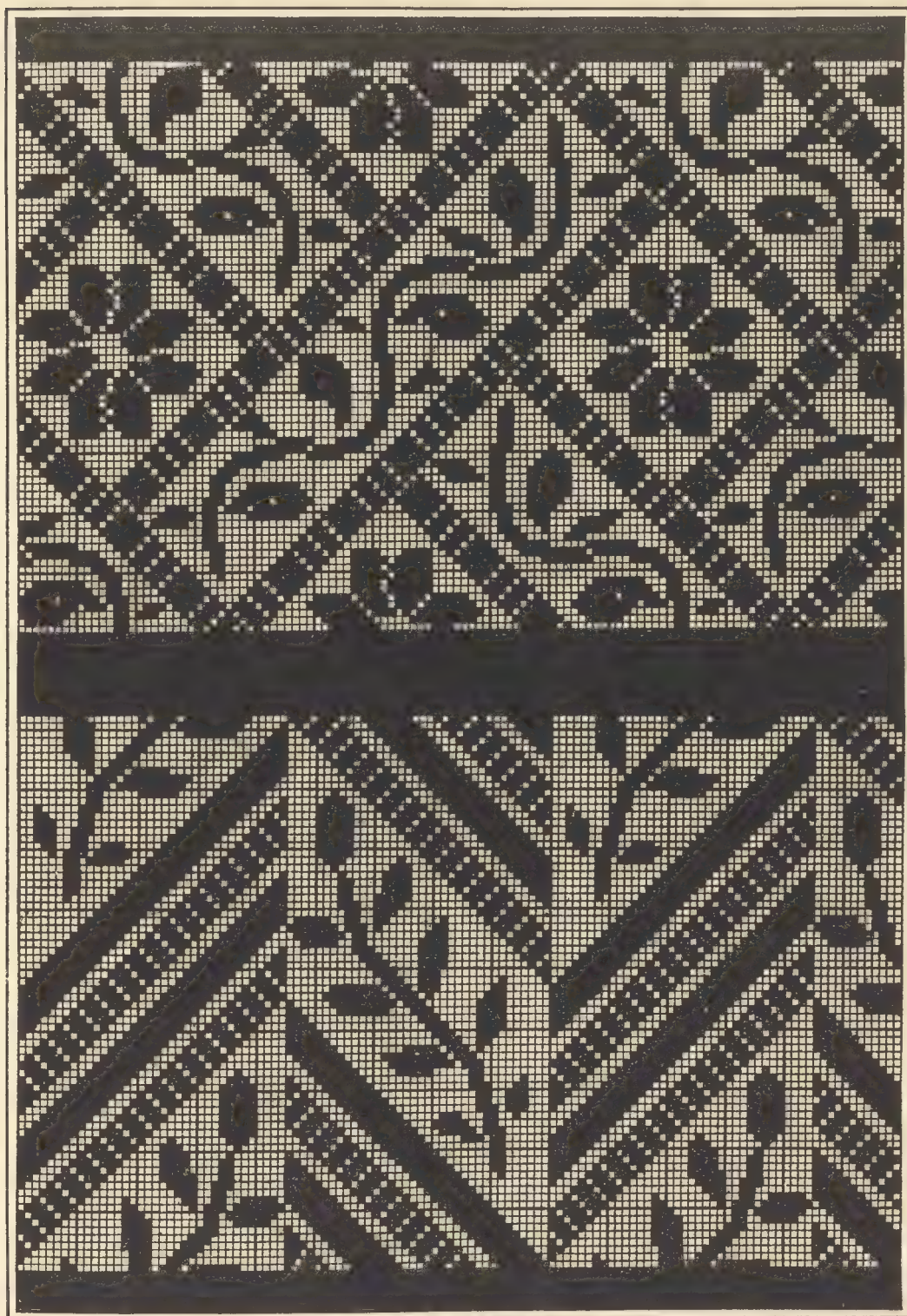
TABLE COVER



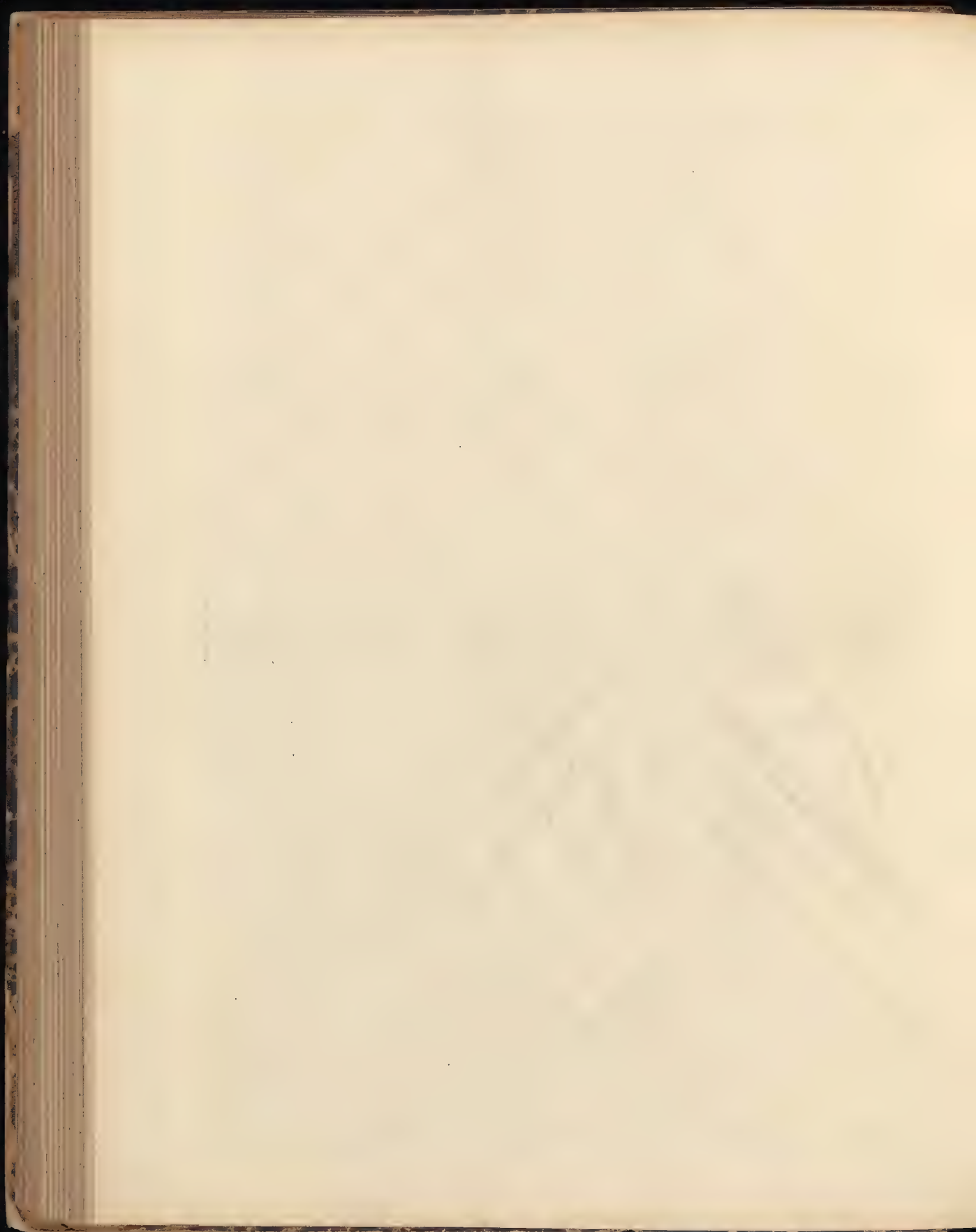


THE JOURNAL OF FABRICS AND TEXTILE INDUSTRIES.

12TH JANUARY, 1886.



DRESS GOODS.



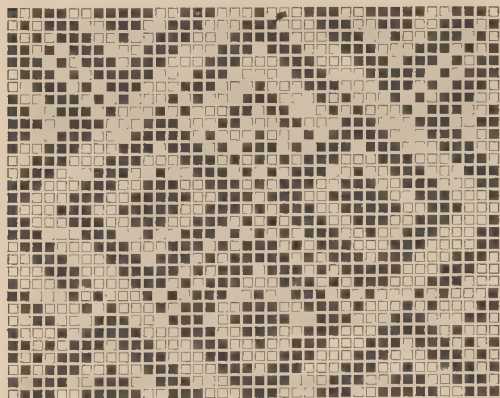


## ORIGINAL DESIGNS.

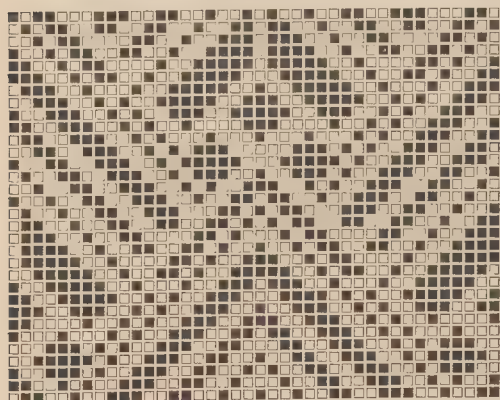
## Designs for Dress Goods.

In a recent number we gave a selection of figures to be used in the manufacture of dress goods. These have been appreciated by a section of our readers, and, therefore, we now give two other figures for the same purpose. The particulars are the same as the last, but, as they are brief, we repeat them. Set 60's; warp, twofold 40's; weft, 30's; 15 picks per quarter, or 60 picks per inch. We give also two designs for dress goods, which will be found on our second separate plate. These should be made as follows:—1/50's cotton warp; 32's lustre or coloured weft; 15 picks per quarter, or 60 picks per inch; 60's sett.

No. 328.

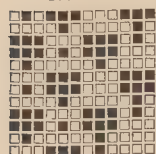


No. 329.



## Trouserings.

No. 330.



Design.

2/40 skeins woollen warp  
and weft.

## Warp:

3 Lavender. 1 Black and White.  
3 Mid. Grey. 11 Black.  
5 Black.  
1 Bismark. 12 picks.

12 ends.

72 ends per inch.

72 picks "

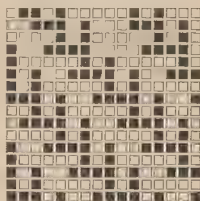
12's reed.

6 ends in each split.

66 inches wide in the loom.

56 " when finished.

No. 331.



Design.

72 ends.

80 picks per inch.

18's reed.

4 ends in a split.

66 inches wide in loom.

56 " when finished.

Warp 2/48 worsted face.  
" 20 skeins woollen back.

Warp and weft alike.

1 Pearl silk or Orange 2/60.

1 Black.

1 Brown.

1 Black.

1 Brown.

5 Black.

1 Drab.

1 Black.

1 Drab.

3 Black.

1 pick silk.

15 Black.

16 picks.

No. 332.



Design.

Warp: 2/24 Botany.

4 Light Lemon.

4 Black.

8 ends.

Weft: 2/40 Botany.

1 Black and White silk.

7 Dark Brown.

8 picks.

72 ends per inch.

72 picks "

18's reed.

4 ends in each split.

68 inches wide in the loom.

56 " when finished.

Clear finish.

## Suitings.

No. 333.



Design.

60 ends per inch.

80 picks "

10's reed.

6 ends in each split.

70 inches wide in the loom.

56 " when finished.

Warp:

1 Orange.

10 Mid Grey.

10 Black.

1 Light Blue.

10 Grey.

10 Black.

42 ends.

Weft:

1 Light Blue.

11 Black.

2 Drab.

1 Black.

2 Drab.

1 Black.

2 Drab.

1 Black.

1 Orange.

11 Black.

2 Drab.

1 Black.

2 Drab.

1 Black.

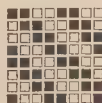
2 Drab.

1 Black.

Warp and weft 2/40 skeins woollen.

42 picks.

No. 334.



Design.

60 picks per inch.

15's reed.

4 ends in each split.

66 inches wide in the loom.

56 " when finished.

Warp:

1 Blue.

7 White.

1 Blue.

5 Black.

6 Brown.

1 Blue.

7 White.

1 Blue.

5 Brown.

6 Black.

40 ends.

Weft:

1 Yellow.

7 White.

1 Yellow.

5 Olive.

6 Bronze.

1 Yellow.

7 White.

1 Yellow.

5 Bottle.

6 Bronze.

40 picks.

2/60 skeins woollen warp.  
2/60 " " weft.



### The American Power Loom.\*

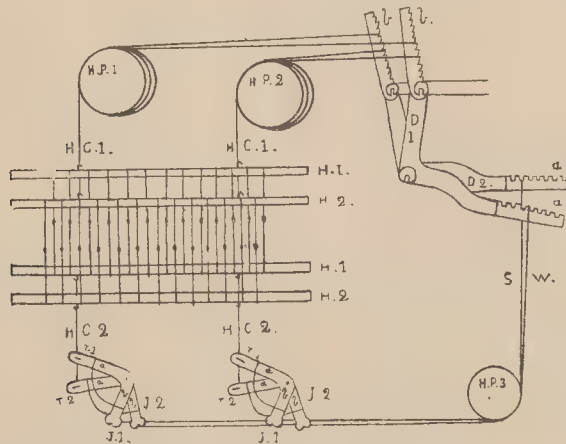
BY ROBERTS BEAUMONT.

(Continued from Page 65)

3. THE HARNESS JACKS.—These are somewhat similar in shape to those used in the ordinary loom, but are made all in one piece with their fulcrum at the elbow. (See D<sup>1</sup> and D<sup>2</sup> Fig. 3. They transmit the motion of the vibrators to the harness. When drawn backward, they elevate the healds, but when propelled forward, they depress them.

4. THE PATTERN CHAIN.—This chain, as in other looms, regulates and controls the movements of the heald shafts. It has already been intimated that it is very differently constructed from that employed in other descriptions of dobbies or engines, for it does not consist of a succession of lags, in which pegs have been inserted, but of steel rods on which bowls, or small pulleys and bushes are arranged, according to the plan or design intended to be produced. Perhaps, this method of imparting the pattern to the mechanism of the engine is simpler and steadier than that of the older plan of using lags. At any rate, it possesses this considerable advantage over the latter, the bowls are not liable to accidents by breakages as pegs are, while they possess a smoother action, lifting the vibrator gears gradually; but, it will be remembered that, the pegs are no sooner brought into contact with the needles of the jack blades than they force the latter simultaneously off

FIG. 3. Shedding Motion.



the rocking bar. Again, a competent workman would, perhaps, prepare a design for the loom as expeditiously on this, as on the former principle. He has only to slip the bowls on to the ends of the rods, the distance between each being fixed by the insertion of thin bushes or tubes, varying in size according to the flushes in the pattern. The bushes serve two important and practical purposes:—they keep the bowls in position, and they define the floats of warp and weft in the cloth, or control the skipping of the shafts like the empty holes in the lags. We now propose to give a general description of this shedding motion, adopting the order in which the separate parts are set in motion. All the shafts are depressed before the pattern chain is placed on the cylinder, we have, therefore, to ascertain by what means they are elevated. Now, if the engine was set in motion, and the pattern chain applied to the cylinder, it would be found that the bowls would lift, while the bushes would depress the shafts. Thus, the bowls, raising the vibrator gears, bring them in contact with the upper cylinder, which carries them and the harness jacks backward; this results in lifting the shafts. They are afterwards lowered by the bushes admitting of the vibrator levers falling, and hence the gears are engaged by the bottom cylinder which pushes the connectors and the harness jacks forward, or into their original positions. Our diagram (Fig. 3) gives a representation of one shed in the making of a plain cloth on two healds, the first shaft, or H<sup>1</sup>, being elevated, and the second shaft, or H<sup>2</sup>, being depressed. This result has been obtained by a bowl lifting the piece lettered B, C, E, in Fig. 2, while a corresponding vibrator lever has been allowed to remain down. The effect of the bowls and bushes on the machine is now very distinctly apparent. We may here mention that the position occupied by the

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vibrator lever and gear shown in Fig. 2, with reference to the harness jacks is shown by the connectors immediately above D<sup>1</sup> in Fig. 3. Harness jack No. 1 or D<sup>1</sup>, has been drawn backward, lifting, by means of the heald cords, the first shaft, or H<sup>1</sup>. The jacks having their fulcrums at the elbow, when pushed forward, rise at *a* and fall at *b*, but when drawn backward, the result is just the opposite, viz., they fall at *a* and rise at *b*. Hence, in the case of the second shaft, it has been depressed by D<sup>2</sup> being moved towards the harness by the low cylinder, and elevated at *a*, from which point it is connected by streamer gearing to the jack levers under the healds. These draw down the shafts. The streamer wire of D<sup>2</sup>, having been passed under the heald pulleys, H P<sup>2</sup> is attached to J<sup>2</sup> at *b*, while the same jack is in communication with the bottom of the healds. So that the final effect of D<sup>2</sup> being raised at *a* is as follows:—It draws J<sup>2</sup> towards the heald pulleys at *b*, which depresses it at *a*, and thus causes it to sink its respective shaft. Having formed the shed, the next work consists in propelling or forcing the shuttle across the loom, so that we must next consider the picking motion. We shall only have occasion to allude very briefly to this part of the loom. The pick jack, or lever, which controls the movements of the picking arms, receives motion from the cylinder gears, a bowl on the end of the rods of the box chain causing it to pick from one side of the loom, and a bush from the other. The motion is driven off the low shaft, which carries an eccentric, this, when brought into contact with the cam on the rocking shaft of the picking arm, propels the latter forward, and thus drives the shuttle across the race of the going part. The loom, being constructed on the under-pick principle, the lower ends of the two picking arms are connected together by a powerful spring, which brings them into striking position after they have been in operation. The motion, on the whole, is simple and effective, but somewhat heavy, if not sluggish, in its action. The setting up of the

FIG. 4. Box Motion.

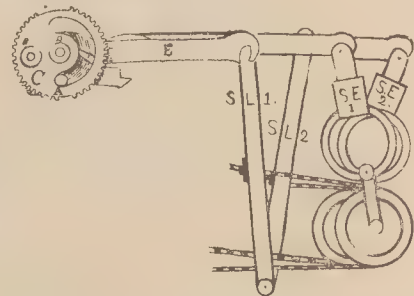


Fig. 3.—B<sup>1</sup> and B<sup>2</sup> Vibrator Levers. C<sup>1</sup> and C<sup>2</sup> Vibrator Gears. E<sup>1</sup> and E<sup>2</sup> Connectors. D<sup>1</sup> and D<sup>2</sup> Harness Jacks. H.P.<sup>1</sup> and H.P.<sup>2</sup> Pulleys for lifting Harness. H.P.<sup>3</sup> Pulleys for depressing Harness. H<sup>1</sup> and H<sup>2</sup> Heald Shafts. J<sup>1</sup> and J<sup>2</sup> Jack Levers for depressing Harness.

Fig. 4.—S.L.<sup>1</sup> and S.L.<sup>2</sup> Simple Levers for elevating and depressing the Second Boxes. S.E.<sup>1</sup> and S.E.<sup>2</sup> Compound Levers for elevating and depressing the Third Boxes.

woven cloth and letting off of the warp or chain are both effected by the swinging movements of the swords of the going part. As these are very similar in mechanism and arrangement to those applied to the old dobby loom, we shall not stay to describe them, but pass on to the shuttle box contrivance, which, like the shedding apparatus, is one of the most complete and one of the newest motions in connection with the loom. The boxes, which are four in number, are under the control of separate levers, similar in construction to those used for raising the healds. In fact, one material advantage in this motion consists in its being worked by the same pattern chain and gearing as that of the picking and shedding contrivances. Thus the box and shedding and picking motions are always in accord with each other, being driven off the same shaft, and actuated by the same cylinder gears, which makes it next to impossible to insert the wrong colour of weft in any shed. As every part of the mechanism for both elevating and lowering the boxes is under absolute control, any possible sequence may be commanded in the most simple manner. The levers are of two classes—simple and compound—and one of each class is required for the complete series of boxes at either end of the loom. Thus the simple levers, if raised by the bowls, would lift the second boxes, the compound levers the third boxes, while, if both the simple and compound levers were raised together, they would lift the fourth boxes. Still more clearly will this motion be understood by consulting fig. 4. We only show the gearing which controls the motion, and not that which is directly instrumental in raising the boxes. It will be at once evident that it is similar to that employed for the harness, so far as the vibrator lever, gears and connectors are concerned, but necessarily different when we reach the simple and compound levers. The Levers S.L.<sup>1</sup> and S.E.<sup>1</sup> have both been operated upon, which would result



practically in lifting the fourth box at the far end of the loom. These are made to work together, when necessary, by passing the chain, which communicates with the boxes, from the simple lever over the pulley of the compound lever. So that S.L.<sup>1</sup> is sufficient to effect the elevation of the second box, S.E.<sup>2</sup> the elevation of the third box; while, if acting in combination with each other, they, as just stated above, raise the fourth box. The principle is that of two levers with arms of different lengths to produce three lifts. The short-armed lever effecting the first lift, the long armed lever the second lift, and the two when combined the third lift. The advantages of this system of shuttling are both numerous and important. Firstly, the chain is simple to construct—for there is only one height and shape of bowl, not several as in the use of links; secondly, the boxes, like the healds, are elevated gradually; thirdly, rising on a spring, they may be pressed down by hand, and, when released, will return to their proper positions; so that, providing any shuttle were to get caught when the boxes were rising or falling, there is no fear of damage resulting.

(To be continued).

### Calico Printing Styles.

The first of two lectures on "Styles in calico printing" was delivered recently at the Manchester Technical School, by Mr. A. Sansone, teacher of the subject at that Institution. Referring, at the beginning, to the development of the art of producing coloured designs on cotton, the lecturer said that the most striking results had been achieved in modern times. A great impetus had been given to calico printing by the application of the wonderful mechanical inventions for which this century would be famous in the history of industry, and by the introduction of art into the designing of patterns. He laid before the audience specimens of modern calico prints of Manchester and of foreign production, some produced in England at the beginning of this century, and a print dated from 1540, produced by Luigi Testori, and lent by Sir Joseph Lee. According to some authors, the lecturer said, staining, or producing designs on fabrics, had been practised fully two thousand years before the Christian era. All the writers were agreed to consider India the birthplace of the art of calico printing, but it was to be gathered, from the writings of Pliny, that the Egyptians were greatly skilled in the production of patterns of different colours by applying or painting mordants on fabrics, and then dyeing by a colouring matter, which was very like madder. Printed calicoes were imported into England in 1627 by the India Company, and patents were granted in this country for the production of printed or stained fabrics in 1610, 1634, and 1675, mostly for linen. The first record of calico printing in Manchester was from 1763, while it was established in Scotland in 1738. Among the difficulties and trials the industry had to go through at its beginning was the excise tax of 3d. per square yard on all printed calicoes, which was put on in 1702, and raised to 6d. in 1714. Curiously enough, in 1720, a law was passed forbidding the wearing of printed calicoes, and cases were recorded of ladies being fined for the offence of wearing calico printed dresses. This law was repealed in 1736, but only partially, and the prohibition was not completely removed till 1774, while the tax was not entirely abolished till 1831. In 1830, the amount of printed calicoes in England was about 8½ millions of pieces, while in 1840, it rose to 16 millions pieces. The price of some prints in 1795 was as high as 2s. 6d. per yard. The block, which in its most primitive form had been used from the remotest times among the Eastern nations, appeared to have been employed in Europe for the printing of fabrics before it was used for book printing; it was certain that the introduction of the block in calico printing had exerted a very marked influence in its development. But it was to the roller printing machines that the development of the industry had now attained was due. The madder style of calico printing was one which had great historical interest, because it was one of the first introduced. But this style was now almost driven from the market. There had been a movement for starting again, in Avignon and the south of Italy, the madder style, but he did not see that, while we had alizarine at so low a price, there was room for the employment of madder. They knew that, by the modern alizarine system, brighter colours were produced than by the madder system. It was said, however, that the colours dyed by alizarine were not so fast as those of madder, but if alizarine were employed in a proper way, they could obtain, not only brighter, but faster colours.



### Improvements in the Manufacture of Carpets and other Terry and Cut Pile Fabrics.

The above invention, by means of which improved goods, having novel effects of design and variegated colouring, can be produced at a lower cost than ordinary Brussels and Brussels Velvet Carpets, &c., relates to the manufacture of such terry and cut pile fabrics as have the pattern formed by means of various threads of different colours, the threads, which require to be lifted to form the pattern, being chosen by means of a jacquard or some similar machine. The improvements consist in manufacturing such fabrics by inserting between the pile threads, which are selected by the jacquard or similar machine, and which are sometimes lifted to form the pile, and at others are buried in the body of the goods, threads which may be either mottled or self-coloured, and which are lifted to pass over every pile wire from one end of the cloth to the other. The object of this invention is, by the juxtaposition of pile threads which are always lifted to form the pile when a wire is inserted, and of pile threads which are selected by the jacquard or other such machine, and which are continually changing, sometimes being lifted and at others being buried in the body of the fabric as may be necessitated by the design, to produce a novel kind of sheeny or variegated fabric. Brussels and Brussels velvet carpets and cut pile fabrics, of this same class, have been composed usually of pile warps of worsted, or other suitable material, for forming the face of the cloth, and of a binding warp, and, in some cases, of a stuffing warp, both of suitable material for forming the back of the cloth; the face warps and the back warp or warps being bound together by weft of suitable material. The threads forming the pile warps have usually been self-coloured, although, in certain cases, some of them have been either mottled or printed; they have been wound upon bobbins and arranged upon creels, those of one colour being usually placed upon one creel. As, is well known to those engaged in the trade, in weaving an ordinary five frame Brussels or Brussels velvet carpet or similar fabric, five pile threads of different colours have usually been drawn into one dent of the reed, together with threads of the backing warp; and the pile thread, which has been required by the design, has been selected from the five threads by means of the jacquard or other similar machine. The threads forming the pile have thus been continually changing according to the requirements of the design, those not required by the design being buried in the body of the fabric, whilst those required by the design have been raised for the insertion of the pile wire to form the pile: thus, the same pile thread has never been raised for the insertion of every successive wire, with the exception of certain pile threads which have been used for forming the ground of the design or for dividing, or for marginal lines in stair carpets, or in the borders of carpets or other similar pile fabrics, and which have been lifted for the insertion of every successive pile wire from the beginning to the end of the design. In carrying out this invention, instead of drawing, into each dent of the reed, five pile threads of different colours, as is usual in the case of a five frame Brussels or Brussels velvet carpet, or other pile fabric of the same class, five pile threads are drawn into every alternate dent of the reed, and the usual backing threads are drawn in and, in addition, a sufficient number of stuffing threads of suitable material to maintain the even character of the fabric. The cards, which act upon the jacquard or other similar machine, are so arranged that, where there is only one pile thread in a dent, it is lifted, by means of the jacquard or other similar machine, for the insertion of every pile wire; but where there are more than one of the pile threads in a dent, one is selected out of each dent by the jacquard or other similar machine, as may be required by the design, and is lifted for the insertion of a pile wire. Although the lifting of the dents of the reed with the pile threads, that work one in a dent, and the usual pile threads alternately are mentioned, it is not necessary to keep exclusively to this arrangement, as the pile threads that work one in a dent can be separated by more than one dent filled with the ordinarily working pile threads, and still produce the desired effect which may be termed a sheeny or variegated effect. The mottled pile threads, and the self-coloured pile threads, are manufactured in the usual manner, which is well known, and are composed of any suitable material or materials. The number of threads of each colour forming one complete mottled pile thread may be varied at will. By this improved mode of manufacture, it will be obvious that many different effects of colour can be produced, without altering the pile threads which work five in a dent of the reed in the usual manner, simply by varying the colours of the mottled or self-coloured pile threads, which work one in a dent of the reed; and, by inserting the mottled or self-coloured pile threads as above described, improved carpets and like goods in great variety can be manufactured with economy. Although five of the ordinarily working pile threads in one dent of the reed have been mentioned, it will be obvious that this number can be varied according to the number of frames required for the production of any desired design.

The Clothworkers' Company have raised their annual subscription to the City and Guilds of London Institute from £3,000 to £4,000, subject to the precedent condition of the Corporation and Associated Livery Companies raising the total of their annual subscriptions to the Institute from £24,500, the present amount, to £30,000. The capital expenditure in the building and equipment of the Central Institution, Exhibition Road, the Finsbury Technical College, and the South London School of Technical Art has been nearly £140,000.





### Means for Extinguishing Fire.

From "The Journal of the Franklin Institute," by C. JOHN HEXAMER.

(Continued from Page 70.)



**SPRINKLERS.**—For some years past mills have been provided with perforated sprinkler pipes, which extend through the mill lengthwise, and are perforated with numerous holes, one-tenth of an inch in diameter, and from eight to ten inches apart. When a fire occurs, the water is turned on by a valve outside the building, water rushing into the pipes, and being discharged through the openings. The great objection which is found to this system in practice is that the water is not confined to those spots only at which the fire occurs, but is distributed over the entire premises provided with such sprinkler pipes, and frequently it was found that the damage done by the water was inestimably greater than that which would have been done by the fire. Another great objection to it, is that it requires human help in order to turn it on, and all who have had experience in *fire technology* know how little this is to be relied upon in case of fire. To overcome these various objections, automatic sprinklers were invented several years ago, the earliest forms being turned on by means of levers with weights attached to them, which were held in position by strings, which, on burning through, released the lever and set the sprinklers in operation. At present, automatic sprinklers consist of a system of pipes, which extend near the ceiling, and the water is released, by valves attached to the pipes, by the heat created by the fire. The valves are kept closed by means of fusible solder, which melts at a temperature of 150°F. or over. The heat which arises from the fire melts the solder joint of the valves immediately over the place where the fire occurs; the water is expelled, and is delivered just where it is needed at the time, and not thrown over the entire premises, as was the case with the former sprinklers. Automatic sprinklers are divided into two great classes, (1) *sealed sprinklers*, such as the Rose, Bishop, Burritt, Parmelee, etc.; and (2) the *sensitive*, such as the Neracher, Kane Bros., Brown and Hall, Buell, Burritt, Grinnell, etc. Automatic sprinklers have now been in use for about twelve years, and a series of tests made by Mr. Woodbury shows that the fusible solder has not deteriorated in that time, but still possesses all its valuable properties. It was formerly thought that the solder would, in the course of time, through corrosion (oxidation and pressure), become worthless, which these tests seem to disprove. The effectiveness of automatic sprinklers is shown by the fact that out of 110 fires in factories, in which they were introduced, and of which the amount of damage was accurately determined, for 87 or 60.9 per cent. no damage was claimed; for 12 or 10.9 per cent. the damage done was less than \$250; for 8 or 7.2 per cent. the amount of loss was between \$250 and \$500; for 11 or 9.9 per cent. between \$500 and \$1,000; for 12 and 10.9 per cent. between \$1,000 and \$20,000. I consider automatic sprinklers to be specially valuable in those parts of factories in which finely divided organic substances or dusts are created, as, for instance, in the picker and card rooms of textile mills, in flour mills, malt mills, and so on, as the water projected from the ceilings precipitates the dust, and, therefore, removes one of the most dangerous sources and causes of fire, and prevents the fire from extending further by means of the ignitable dust. By a series of tests made by Professor Morton, President of the Stevens' Institute, for the New York Board of Underwriters, it was shown that the tank which supplies the sprinklers should in every case be at least ten feet above all pipes; and the following table shows the amount of water which is used in fifteen minutes for pipes of the following diameters, to which the number of sprinklers indicated are attached:

*Tank, ten feet above all pipes.*

Diameter of Pipe.	Number of Sprinklers Supplied.	Gallons running for 15 minutes.
$\frac{3}{8}$ inch.	2	212
1 "	4	424
1 $\frac{1}{4}$ "	5	530
1 $\frac{3}{8}$ "	9	934
2 "	16	1,696
2 $\frac{1}{2}$ "	25	2,550
3 "	36	3,816
3 $\frac{1}{2}$ "	49	5,194
4 "	64	6,784
5 "	100	10,600
6 "	114	15,264

**STEAM JETS.**—Live steam is one of the best agents we possess for extinguishing fires in small inclosed compartments. All small rooms,

such as picker and drying rooms, should be supplied with ample sized steam jets. In order to make steam jets effective, they should be turned on from the outside, the valves being located in some secure position, as the first impulse of every one, in case of fire, is to run out; when reason returns, a person is more apt to turn on a valve from the outside than he would be to enter the burning room and turn the valve. But, in order to make a steam jet absolutely effective, it should be automatic. For this purpose, I invented the following device:—On the steam supply pipe a ring is tightly fitted, to which is attached a rod, which, on its end, is formed into a fork-like projection. On the top of this fork a bar is placed, to which a rope, impregnated with substances which will cause it to burn rapidly when ignited, is attached; and the two sections of the rope are held together by means of a fusible solder joint. This rope serves to hold in place a lever to which a weight is attached. This lever is in connection with a valve. I use for this purpose a spring valve, constructed by the Bellfield Valve Company, which will not corrode, and which works easily and well in all cases. To the small rod, which rests on the open fork, a rod is attached, which passes through a small slot or pipe in the wall to the outside, and to it a convenient handle is attached. Now, let us suppose that a fire occurs in a picker room, and that, as is generally the case, the employé runs out. Should one of them be cool headed enough, he would go to the outside, pull the handle, and thereby draw the bar, which rests loosely on the open fork, from the fork; the lever would drop and open the steam into the room. But, let us suppose that the employé has not the proper amount of coolness, and runs away without turning on the steam from the outside. Then the temperature will rise to 160°F., the temperature at which the fusible solder joint will melt and separate (the solder joint may be fixed for any temperature by altering the composition and proportions of the ingredients of the solder); the lever will be released, as in the former case, and the steam turned on. Let us, however, suppose that through some unforeseen accident the solder joint would not work, then we still have as a third means the extremely inflammable rope, which would soon be ignited, and burn through, thus causing the valve to be turned on. We, therefore, have three alternatives, one of which would undoubtedly come into play. In all steam jets, be they automatic or otherwise, valves should be used which can be turned on readily. I have frequently found valves so tightly corroded and stuck fast, that they were worthless in case of fire.

**EXTINGUISHERS.**—Extinguishers contain water which is of value on account of the carbonic acid gas which it contains, which replaces the air, the burning body being at the same time incrustated with a layer of salts. Carbonic acid is an excellent extinguishing agent in any form. I suppose you all have seen the experiment of extinguishing a number of candles placed in a trough, by pouring carbonic acid gas in one end and allowing it to flow through. One of our large soda water establishments has extinguished several small fires in their building and neighbourhood by means of the carbonic acid contained in their soda water appliances. A druggist extinguished a small fire of benzine, which had ignited in his store, by a bucketful of soda water, which he sensibly drew from his fountain and poured upon it, instead of using ordinary water, which would have been of no avail. Extinguishers, in the proper sense of the term, as first used, consist of apparatuses containing gas, which in case of fire is liberated, displacing the air, and thereby extinguishing the fire. The apparatus of Cartier consists of a cylinder of sheet-iron, which is tested to a pressure of eighteen atmospheres. To both ends are attached bottoms of sheet steel, and by means of a specially constructed filling pipe in the upper end, water and bi-carbonate of sodium are poured, and the pipe tightly closed, and, when used, tartaric acid is injected by a special device, which causes the formation of carbonic acid gas and sodium tartrate. These are partially dissolved by the water, and the gas produces a pressure of from four to seven atmospheres on the contained liquid, which, when the cock of the nozzle is opened, produces a strong stream. Shaeffer and Budenberg use the same substances under a pressure of ten atmospheres. Instead of the expensive tartaric acid, Zabel and Dick first substituted sulphuric acid. In Dick's apparatus, the sulphuric acid is contained in a separate glass, which, in case of fire, is broken, and then reacts on the bi-carbonate of soda. In Zabel's apparatus, the sulphuric acid is contained in a glass cylinder, which is turned upside down in case of fire, and the cover, thereby opening, allows the acid to flow out and mix with the salts; thus producing the gas. Similar to these are the apparatuses of Masnata, which release carbonic acid gas with sulphuric acid and the carbonates of different elements; and the apparatuses of Baragwanath and Van Wisker. Among the efficient American extinguishers may be mentioned the Harkness Pneumatic Extinguisher. There is also a new extinguisher called "The Climax." In this, sodium bi-carbonate, and oxalic acid are used. The extinguisher is charged with water, and the dry material is placed in two receptacles above it. When used, the dry material is dropped into the water by relieving the bottoms of the receptacles, which are attached by hinges; carbonic acid gas is generated, and oxalate of sodium formed, the charged water being ejected by means of a small pump attached to the apparatus. This is an excellent extinguisher, while used on the floor, as it may be frequently refilled, fresh substances being added, and the pumping continued; but it cannot be used on ladders, as is necessary in reaching ignited substances on high walls or ceilings. Platt's extinguisher has been used with great success for many years. Its great value consists in its simplicity, as the most ignorant workman can be readily taught to use it. It is put into operation by merely turning the valve



handle as far to the left as possible, and turning the extinguisher upside down. In selecting fire extinguishers, we must, as in choosing all other machinery, take those which are simplest and least apt to get out of order, and those which contain substances and arrangements by which the metal of the apparatus is not corroded, as many are put into the market, which will last but a few years, on account of their corrosive nature and method of placing the ingredients. Of late, so-called hand grenades have been used. These devices, though highly ornamental, I do not approve. The extinguishing material is contained in bottles, which must be broken in order to cause the extinguishing liquid to be spread over the flames. It is exceedingly difficult to break the bottles over a fire, by taking two bottles, as is generally advised, and breaking them over the point of danger; while we frequently find the bottles, which are strongly made, are not broken by throwing them into inaccessible places, or into such materials as burning yarn, raw stock, waste, etc. The joke of a prominent underwriter, when he first saw them, is perhaps not out of place; he said that in case of fire, one would be apt to look for a cork-screw to remove the cork in the bottle before putting out the fire. The wire racks in which some grenades are placed are valuable additions. These consist of wire baskets, so arranged that, when the grenades, are removed from them, a fire alarm is given.

### The New Flax Scutching and Hackling Machine.

The question of the new scutching machine continues to agitate the whole linen world. *La Flandre Libérale* and the *Progrès du Nord* contain some very sensible remarks relating to the constitutive conditions of flax. They deserve attention. In replying to the correspondent in *La Flandre*, we must draw his attention to the fact that the sample of flax proceeding from the scutching machine—the appearance of which we have announced this month—is quite glossy and ribbony, and possesses the same character as flax scutched by hand. The working, however, of the product of this machine, will the better enable us to form a judgment. Here is a letter addressed to *Le Progrès du Nord*, which treats of the subject at length:—Monsieur le Directeur,—You published in your paper a letter which will call the inconsiderate enthusiasm of certain French spinners for the new *teilleuse*, which, according to them, must revolutionise the flax trade. Your correspondent proves that the new *teilleuse* leaves but the semblance of a profit, since it is absorbed by the great capital necessary to the construction, fixing, surveillance, &c., of the famous new machines for *teillage*. There still remains to be considered another thing on which your correspondent has not touched, but which is, however, vital. The flax in it being greatly bruised by the prickles requires but little beating to free it from the straw. Further, with this *teilleuse* the flax cannot be much beaten, because it floats (or waves) when struck, having no support whatever. It is just because, in the new *teilleuse*, the flax is less beaten that one receives a greater return: but (unhappily there is a but) the less a flax is beaten, the less fine it is. On the contrary, the more it is beaten, the finer it becomes. What is gained in fineness by a sufficient beating is lost in the yield. Now the value of a kilo of flax *teillé* or *peigné* (combed) depends upon its fineness. A flax worked by the new process will give, because it is less beaten, a flax *teillé* and combed *coursier* than that worked by the old method. The difference will be at least 40 to 50—it may be 50 per cent. in favour of the old process. There is still to be taken into account another superiority, which is that the result of the old process is a regular flax. It is not the same with the new process. Flax grows irregularly; in all the sheaves of flax there are parts thicker, others finer, and which neither soaking nor *teillage* will equalise; these unequal parts are called veins. With the new process, the operation being automatic, every part undergoes the same course, receives the same number of blows, and the same number of bruises. The result is that the flax coming out of this new process is absolutely irregular, as it was before entering the machine. It is otherwise with flax undergoing the old process. Here the work is conducted by the hand of a workman, who causes the irregularities to disappear by bringing back over his flax comb the more water-retted veins, so as to preserve them from an excess of blows; he thus obtains a regular flax. Here we have the intelligence of the workman who presides over the operation. The automatic process will never obtain such a result. I therefore think there has been "much ado about nothing,"—a mountain bringing forth a mouse."



The Hon. T. G. Shearman, Chairman of the Executive Council of the American Free Trade League, of which the Hon. David A. Wells is the president, is at the present time on a visit to the United Kingdom, and to the manufacturing centres on the continent of Europe, for the purpose of collecting evidence to be used in America in support of the agitation for freedom of trade.

The woollen trade of Elbeuf continues dull, with unsatisfactory prices, according to the *Yacquard*. Hopes are expressed that the Madagascar treaty and the settlement of the Tonquin question may be followed by a revival of trade. Meanwhile the tailors of Paris have given great satisfaction to the cloth manufacturers of Elbeuf by promising to do their utmost to induce their customers to select French instead of English fabrics. It is reported, on the other hand, that several Paris and Lyons merchants have decided not to buy any more German cloths at any price, in consequence of the frequent complaints concerning their excessively bad quality. From Austria, it is reported that, after a slight revival in consequence of the receipt of some orders from Servia, the Brünn woollen trade has again become extremely dull.

"Sell's Telegraphic Code" (London: Henry Sell) is the sufficiently explanatory title of a new code just published. The compiler has aimed at producing a code from which it would be as easy to make up a telegram as to interpret one. He claims to have avoided the complications and difficulties of some other codes by giving each phrase a code-word of its own, and by arranging both the words and the sentences they represent in alphabetical order. None of the words exceed five letters. The code is not too extensive, as it is limited to ordinary phrases of everyday use in business. There appear, however, to be upwards of 2,000 phrases. As the book is the outcome, it is stated, of many suggestions by subscribers to the same publisher's "Directory of Registered Telegraphic Addresses," the phrases will doubtless be found sufficiently comprehensive for ordinary purposes.

The month of January and the distribution of Trade calendars come upon us simultaneously. From year to year, many new ideas have come to light in this connection. But, perhaps, the best of all, which we have received, is one from Messrs. M. Nairn & Co., the Floor Cloth Manufacturers, of Kirkcaldy, Scotland. The calendar, or to be more correct, the diary, is a small volume, bound in scarlet leather, with gilt edges, and the contents are as substantial as the binding. Thus, to commence with, are small views of their works and warehouses, followed by the months, prettily arranged upon various landscapes, and opposite each appears a coloured facsimile of one of the firm's patterns of Floor Cloth or Linoleum. Following these will be found Postal information, Holidays, Terms, &c., Useful information, Profit and Return Tables, Discount and Percentage Tables, and Memoranda. This little book forms the very best thing we have yet seen as a specimen of trade enterprise in calendars.

Mr. Ruskin has taken a very great interest in the establishment and prosperity of a mill in the Isle of Man. We may be jocosely upon this mill (which would not be a factory), and very funny at the expense of the water-wheel—not steam, mind you—which supplies the motive power. That Mr. Ruskin hates factories and steam engines is, however, only a trifle beside his magnificent genius, and we should not expect him to go counter to his beliefs and teachings so far as to countenance either. This Laxey mill is feeling the effects of the discontinuance of the issue of *Fors Clavigera*, and appeals are being made for support of the cloths and flannels to the manufacture of which it is devoted, more especially as they are claimed to be of absolutely pure materials. A dress piece of one undyed woollen stuff has been sent, by Mr. Ruskin, to the Duchess of Albany for her acceptance. The fabrics turned out at the mill—of which patterns are before us as we write—certainly appear to be of honest materials and manufacture, and if they could only be brought into public notice without so much abuse of the finish of stuffs which compete with them, would have our unqualified commendation.—*Warehouseman and Drapers' Journal*.

The year's working of the Oldham Spinning Companies has been far from a profitable one; and the profits, compared with the losses, show a falling off. The gross profits of 80 companies are £121,581, while the gross losses amount to £112,476, which gives a balance profit of £9,105 earned in twelve months. On the other hand, taking a full list of 87 companies, the gross profits are £52,789, and the losses £55,519, showing a loss of £2,730, so that, generally speaking, the share capital of the Oldham limited cotton spinning companies has been entirely unremunerative during the past twelve months. Last year the net earnings of about 60 companies amounted to over £125,000, so that 1885 compares very unfavourably with 1884, which was by no means a good year. Of 60 companies the first quarter of the year shows 16 *nils*, second quarter there were 22, third quarter, 55, and the fourth quarter, 56—a very striking illustration of the condition to which the trade was reduced during the last six or eight months of the year. The average dividend, in comparison with the previous year, shows a great falling off, in some cases as much as seven per cent. The price of shares also shows a great fall on the year. Altogether, the year's trade has been most exceptional, including the strike of thirteen weeks, and the future prospects cannot be said to be of a very roseate character.



### Receiving Orders.

Heap, H. (trading as Whitecroft Printing Company), 61, Faulkner Street, Manchester, calico printer.  
 Morris, R., and Pratt, T. A. (trading as Morris and Pratt), 28, St. Mary Gate, Nottingham, lace manufacturers.  
 Taylor, J. C. (trading as Edward Taylor and Sons), Oatlands Mills, Leeds, Yorkshire, cloth finisher.

### Adjudications of Bankruptcy.

Gill, J., High Street, Manchester, woollen merchant.  
 Taylor, J. C. (trading as Edward Taylor and Sons), Oatlands Mills, Leeds, Yorkshire, cloth finisher.  
 Ward, W., and Ward E. (trading as E. P. D. Ward and Co.), Bradford Road, Dewsbury, woollen manufacturers.

### Dividends.

Archer, C., 84, Outgang Lane, Radford, Nottingham, lace manufacturer, 2s. 10d. (first and final), Official Receiver's Offices, 1, High Pavement, Nottingham.  
 Barron, J. H. (separate estate), Beaconsfield Cottage, Scarcroft, near Leeds, Yorkshire, woollen manufacturer, 6s. 10d., Official Receiver's Office, 22, Park Road, Leeds.  
 Carter, Harriet, Upper Langdale Street, Elland, Yorkshire, woollen manufacturer, 5s. 7d. (first), Official Receiver's Offices, Town Hall Chambers, Halifax.  
 Corbett, J., and Corbett, J. F. (trading as John Corbett), Terry's Mill, Dudley Hill, near Bradford, Yorkshire, stuff manufacturers, 9s. 4d. (first and final), 9, Market Street, Bradford.  
 Illingworth, W. H. (separate estate), Owllet Grange, Horsforth, Guiseley, Yorkshire, woollen manufacturer, 11s. 9d., Official Receiver's Office, Park Row, Leeds.  
 Patchett, A., Bradshaw Mill, near Halifax, Yorkshire, worsted manufacturer, 2s. 3d. (first and final), Offices of Trustee, Townhall Buildings, Halifax.

### Dissolutions of Partnership.

Bennett, C. H., Armitage, D., Bennett, Fannie, and Rogerson, W. J., Leeds, cloth merchants and manufacturers.  
 Haggas, W., and Haggas, J., Ingrow and Oakworth, near Keighley, worsted manufacturers.  
 Williamson, F., and Williamson, J., Haworth, Bradford, Yorkshire, worsted stuff manufacturers.

## PATENTS.

### Applications for Letters Patent.

Apparatus connected with machines for dyeing and sizing warps made from worsted, &c. W. E. Ackroyd and W. W. L. Lishman, Bradford. 3rd Dec. 14,840  
 Actuating drop boxes in looms. D. and W. A. Crabtree, Bradford. 24th Dec. 15,834  
 Brussels and Jacquard velvet carpets and apparatus therefor. E. Steidel, London. 9th Dec. 15,127  
 Carding engines. T. B. Kay, Manchester. 4th Dec. 14,876  
 Carding engines. T. B. Kay, Manchester. 4th Dec. 14,877  
 Calendering or finishing, &c. J. and J. Rigby, London. 5th Dec. 14,936  
 Crimped yarns or threads, braids, plaits, and trimmings. A. M. Clark, London. 9th Dec. 15,140  
 Circular combing machines. J. and J. Richardson, Bradford. 11th Dec. 15,227  
 Cotton and wool drying machines. J. H. Lorimer, Philadelphia. 16th Dec. 15,459  
 Carding engine cylinders. G. and E. Ashworth, Manchester. 17th Dec. 15,490  
 Certain kinds of yarns. R. G. Laidlaw, Glasgow. 19th Dec. 15,638  
 Dabbing brush. J. H. Exley, Bradford. 7th Dec. 14,971  
 Driving spindles in spinning and twisting frames. W. T. Garnett, Bradford. 9th Dec. 15,099  
 Drying textile and other fabrics and tissues. G. Spencer, Manchester. 9th Dec. 15,101  
 Dressing rollers for flax and other fibres, and methods of applying same. W. Scott, Belfast. 17th Dec. 15,496  
 Dyeing felt and woven fabrics. H. J. Haddan, London. 22nd Dec. 15,761  
 Embossing canvas for walls, &c. W. S. Morton, Glasgow. 2nd Dec. 14,793  
 Expanding or stretching woven fabrics. Messrs. Arnfield, Manchester. 3rd Dec. 14,835  
 Embossing or printing on tissues, fabrics, &c. S. Stansfield, and E. J. Homan, Manchester. 23rd Dec. 15,791

Fancy yarns and apparatus. J. H. Craven and J. Crabtree, Keighley. 9th Dec. 15,098  
 Feeding wool, &c., to carding engines. W. Cliffe, Halifax. 18th Dec. 15,540  
 Fancy cotton yarns, and apparatus therefor. Dickinson Bros. and Co., Halifax. 21st Dec. 15,669  
 Guiders for cotton and other winding frames. D. Hall, Glossop. 16th Dec. 15,423  
 Guipure lace on bobbin, net or twist lace machine. H. A. Brownson, London. 18th Dec. 15,566  
 Heald shafts of looms. R. Field, Halifax. 2nd Dec. 14,786  
 Holding down spindles of spinning machinery. R. N. Cottrill, Manchester. 21st Dec. 15,682  
 Jack guards for looms. J. Watson, Halifax. 15th Dec. 15,323  
 Looms for carpets, &c. E. Smith, London. 5th Dec. 14,935  
 Looms for fancy looped fabrics. M. Snowden, Halifax. 17th Dec. 15,481  
 Material suitable for blankets, coverlets, wearing apparel, &c., and apparatus therefor. C. Tell, Manchester. 14th Dec. 15,313  
 Opening and cleaning cotton, &c. W. and W. Lord, Manchester. 5th Dec. 14,927  
 Opening and scutching cotton, &c. B. and A. Dobson, Manchester. 18th Dec. 15,548  
 "Openers" and "scutchers." J. Hilton, Manchester. 19th Dec. 15,634  
 Producing printed patterns and shades on the figuring of muslin and leno harness goods. A. Dux, Manchester. 1st Dec. 14,727  
 Pressing fabrics. P. M. Justice, London. 2nd Dec. 14,805  
 Preparing green or steeped textile material for carding. H. Dansette, London. 3rd Dec. 14,854  
 Printing web fabrics. J. Macnab, Glasgow. 3rd Dec. 14,864  
 Printing scarfs, &c. A. S. Young, Manchester. 7th Dec. 14,974  
 Printing on calico and other woven fabrics. A. S. Young, Manchester. 7th Dec. 14,975  
 Pendants and pendent pulleys of scutchers and openers. L. Hargreaves, Halifax. 17th Dec. 15,493  
 Preparing cotton, &c. W. and W. Lord, Manchester. 18th Dec. 15,547  
 Preparing filamentous materials. A. M. Clark, London. 18th Dec. 15,590  
 Preparing warps for weaving patterns. R. G. Neill, Glasgow. 21st Dec. 15,690  
 Reel for wrapping and holding pile fabrics. C. Longbottom, Bradford. 1st Dec. 14,749  
 Raising cloth and other fabrics. R. Sellers and G. Pearson, Bradford. 2nd Dec. 14,781  
 Ring spinning, and ring doubling machines. J. Dodd, Manchester. 10th Dec. 15,182  
 Shuttles. S. Whitworth, London. 1st Dec. 14,722  
 Spinning and doubling cotton, wool, &c. S. A. Luke, London. 1st Dec. 14,740  
 Self lubricating bearings. J. Matthews, Liverpool. 4th Dec. 14,879  
 Spinning, doubling, and winding yarns. J. Knowles, Blackburn. 4th Dec. 14,886  
 Self-acting let-off motions for steam power looms. T. H. Brigg, Bradford. 8th Dec. 15,034  
 Shuttles. H. B. Talbot and A. Gledhill, Halifax. 9th Dec. 15,107  
 Stretching cloth, &c. J. E. Valentine, London. 10th Dec. 15,175  
 Screw gill-boxes for preparing wool, silk, &c. G. W. Douglas and J. Shaw, Bradford. 12th Dec. 15,265  
 Spinning and twisting frames. H. Bottomley, Bradford. 14th Dec. 15,312  
 Shuttle throwing mechanism for looms. W. P. Thomson, Liverpool. 15th Dec. 15,375  
 Spinning mules. G. Leonard, London. 16th Dec. 15,448  
 Scutching or cleaning flax, &c. J. Barbour and A. Combe, London. 16th Dec. 15,458  
 Trap roller twisting or doubling frames. E. Morley, Halifax. 5th Dec. 14,918  
 Treating vegetable spinning fibres. M. E. Cohn, London. 15th Dec. 15,391  
 Tying or connecting jacquard cards. P. Ambjorn, London. 16th Dec. 15,456  
 Textile fabrics. W. R. Lake, London. 21st Dec. 15,717  
 Treatment of flax, hemp, china-grass, &c., to obtain fibres. T. R. Shillito, London. 23rd Dec. 15,809  
 Turkish towellings, terries, &c. E. and G. W. Wilson and J. Fell, Manchester. 28th Dec. 15,911  
 Unwinding the warp off the warp beam in looms. T. H. Blamires, Huddersfield. 12th Dec. 15,290  
 Woven fabrics, the weft of which is formed of unspun plant stalks. C. D. Abel, London. 12th Dec. 15,287  
 Winding thread on tubes, &c. J. C. and F. A. Spach, London. 15th Dec. 15,385  
 Weft thread knitting looms. J. J. Adgate, London. 15th Dec. 15,407  
 Woven driving bands or belts. S. Ogden, Manchester. 21st Dec. 15,679  
 Wool-washing. W. Robertshaw and E. Cockroft, Bradford. 24th Dec. 15,833  
 Waste cotton yarns. E. Edwards, London. 24th Dec. 15,871

### Patents Sealed.

15,654	1,303	11,591	2,257	10,269	15,979	16,549
16,664	12,535	13,839	15,161	16,808	9,319	13,937
2,592						



# The Journal of Fabrics

AND

## Textile Industries.

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The American Power Loom.	

### Important Notice to our Readers.

It has been our aim in the past to make the "Journal of Fabrics and Textile Industries" a thoroughly representative organ of the Textile trades, and in this we have succeeded to the satisfaction of a large number of firms who have favoured us with their patronage. It is our intention in the future to add important changes to those already made. We have secured thoroughly practical writers on subjects of vital importance to manufacturers generally, and we are in treaty with French designers to furnish us with some of their best productions, suitable for every branch of the various trades in which designs are used. These improvements will naturally entail greater expenditure upon us, and, therefore, the annual subscription will be increased to Ten Shillings to all New Subscribers, but present Subscribers will still be charged as before, viz., Seven Shillings per annum. The subscription for United States and Canada is Two Dollars, Fifty Cents, and for all other places abroad, an equivalent to Ten Shillings.



### Improvements in Lighting by Gas.

**T**HAT it is necessary to have good light in our cotton factories will be at once admitted by every one. During the hours of darkness, artificial lighting has to be resorted to. In these days, when so much is heard about lighting by electricity, it may seem somewhat unnecessary on our part to devote an article to Gas Lighting; but, whilst willing to admit that there is a great future for lighting by electricity, we, writing, as we do, for the present as well as for the future, feel convinced that a few words upon the improvements which have, in late years, been made in the system of lighting by gas, may be of advantage to our readers. These improvements have increased the efficiency, as well as reduced the cost, of lighting by gas. The present heavy outlay, which those who adopt electric lighting have to expend, puts that system out of the reach of many; and every economy effected in the old system is a distinct gain to those who are unable to spare the large amount of capital, which would be required were they to adopt the new. The improvements, we seek to describe in this article, have been found to effect a saving of from 25 per cent., to even, in some cases, 60 per cent., and, in nearly every case, the cost of the alterations will be recouped during the first twelve months. In order that the best light may be obtained from gas at the least possible cost, and this is what all seek to attain, it is necessary to consider the subject in all its bearings, and then to adapt their principles, as far as possible, in each individual case. The best results are obtained where gas is being consumed from burners, which are

supplied at a pressure of from three to six-tenths. Whatever pressure is desired, that pressure must be regular, and not subject to variations. When gas is consumed from burners at the pressure already mentioned, it is able, by combining with the oxygen of the atmosphere, to give out the best illumination. The pressure in the gas companies' mains varies from ten to thirty-tenths, and is always found to be more or less irregular, according to the instant requirements of the gas companies' customers, and the action of the officials at the gas works. Now, when gas is forced through a burner at a high pressure, much of it is simply wasted, as it is impossible to burn all the gas that passes from the aperture of the burners usually employed. Further, a gas which, at five-tenths pressure, will give a light equal, say, to eight candles, would, at twenty-tenths, only give a light equal to six candles, although burning nearly twice as many cubic feet per hour. As, however, the leading gas mains are considerable items in the cost of fitting up a works, it is advantageous not to reduce the pressure in these, but to effect that reduction in the room in which the gas is to be consumed. Besides the important questions of regular and low pressure, we shall have something to say about so arranging the lights that the illumination from each burner may be thrown where it is required, viz.:—upon the machinery and work, and not, as is now too largely the case, upon the ceilings of the room. It will, perhaps, be well to indicate the most approved method of arranging the gas mains before we proceed further. Of course, it is necessary to have the mains large enough. In cases where they are proved not to be of sufficient capacity, the improvements, we are to consider later on, may obviate the necessity of new mains, by reducing the duty they have to perform. In some cases, gas mains have been found to be partially corroded up, and instances have been known where they had become coated with a hard lining of over  $\frac{3}{8}$  of an inch, thereby reducing a 3 inch main to only  $2\frac{1}{4}$  inches, which means a reduction of nearly  $\frac{2}{3}$  of the main's capacity. Small pressure gauges are made, by which the pressure in the mains or gas pipes may be tested, and, as their cost is but small, we should recommend their purchase and use by all large consumers. It is surely unnecessary to state that the pressure in the mains must be greater than that at which it is desired to supply the gas at the burners. The gas main should, in all cases where possible, enter the premises at a central point, or, if that is not possible, should be so arranged that it is run to a central point before it branches off to supply the different rooms. We prefer the main not to be laid in the ground after it enters the mill premises, as we have known many cases where serious leakages have taken place, which were not found out until the large increase in the quarter's gas bill caused search to be made for it. In all cases, we recommend that the number of feet burned should be ascertained every week, and a record kept of it for reference and comparison. When the mains are laid in the ground, it is very important that they should be properly and sufficiently protected at those points where heavy loads may, from time to time, be taken across them. They should never be laid in cinders, as, when so laid, they corrode much sooner. If the subsoil is composed of cinders, clay should be procured and placed all round the pipes. As we have before stated, the main should enter the premises at a central point, and it should also enter the buildings at some point, such as the main staircase, where it is readily got at. A valve should be placed here, so that the gas, when not required, may be turned off. Where the meter is some distance from the different buildings supplied, it is usual to have valves to each range of branch mains, as well as on the feed side of the meter. In large concerns, it is also usual to have a tap on each landing where the pipes leave the branch mains to enter the rooms. Gas should be turned off when not in use, as there is always more or less leakage from the pipes. In those concerns where, unfortunately, some buildings require gas much sooner and longer than the others, arrangements are made by which it can be supplied to those without it being supplied to the remainder. It is also usual to supply the engine-house, boiler-house, mechanics' shop, and sometimes the cloth warehouse, from an independent main. When the taps for shutting off the gas in each room are placed in inconvenient positions, such as at the further ends of the rooms, they seldom, if ever, get closed with any amount of regularity, and in the case where a number of small rooms are to be lighted, it is found to be preferable to have



only one tap for a like reason. Where a long room has to be lighted, it is now usual to take the main pipe to the centre of the room. At this point, fix a gas governor to regulate the pressure. The main pipe is then taken across the room. It is from this latter length of piping that the line pipes, from which the pendants hang, are branched to the right and left. This method equalises the pressure, and is not really more costly, as the line pipes do not require to be so large.

Of gas governors there are several makes in the market—all more or less good. Some of these require the use of mercury; we do not think these the most satisfactory for mill purposes. We prefer the one which employs a flexible diaphragm of leather, as being the simplest and least liable to get out of order. It may interest our readers to give a few figures to show what saving has been effected by gas governors in concerns of repute.

A.	9 months' consumption, without regulator	- -	693,700 feet.
	Similar 9 months' consumption next year, with regulator		443,200 "
		Saving	250,500 "
B.	6 months' consumption, without regulator	- -	3,335,800 "
	Similar 6 months' consumption next year, with regulator		2,470,000 "
		Saving	865,800 "
C.	6 months' consumption, without regulator	- -	2,298,000 "
	Similar 6 months' consumption next year, with regulator		1,488,500 "
		Saving	809,500 "

These gas governors or regulators can be set so as to pass the gas at any required reduced pressure, and are arranged that, when so set, they can be locked up, in order that they may not be tampered with by the meddlesome. Where they are applied, one half the lights in a room may be turned out without in any way increasing the pressure at the other burners. Where gas governors are not used, the result is that, when any quantity of lights have been turned out, the others flare up. It is not to be expected that the workmen or workwomen in the room would be found so mindful of their employer's interest, as to check the pressure by turning the taps on each pendant, or by partially closing the tap on the main pipe. In erecting gas piping, especially in the mains, avoid, as far as possible, the use of elbows; bends are much preferable. From an idea of economy, do not have the pipes on the lighting side of the governor too small. Reduced pressure requires somewhat larger pipes to supply any given number of burners. One point we must not omit to mention, viz.:—that in cases of fire, the taps upon the staircase will be found very useful. The presence of a supply of coal gas must, of necessity, materially increase the destructive power of a fire, and, when the gas can only be turned off at the meter, it is apt to be forgotten until too late; besides, it may be inconvenient to turn off the gas in all the rooms, because of a fire in one. For this reason alone, the taps should never be placed at the end of a room furthest from the staircase. Next month, we hope, in continuation of this subject, to describe the improvements made in the distribution of light, and to give a number of results, both in spinning and in manufacturing concerns, which, we believe, will be of no little value to our readers.



### Museums of Trade Patterns.



IN our issue of September, we published a letter, written by Mr. Ablett to the *Manchester Guardian*, on the subject of "Museums of Trade Patterns." During the last month, further notice has been drawn to this subject by means of a paper read before the Society of Arts by this gentleman. As we recognise this as a topic of the utmost importance to manufacturers, we have great pleasure in giving publicity to a resumé of the paper. Mr. Ablett says:—"The prevailing depression of trade, in many leading branches of industry, lately, has caused the conviction that no steps should be neglected to be taken, in any direction, that are likely to be the means of giving assistance to manufacturing enterprise and technical skill. The general idea of a museum is that it enshrines the past, and, as time rolls on, the collection that should accumulate would show, in a very interesting manner, the yearly progress of manufacturing and inventive skill." After some further remarks, Mr. Ablett, relates the cause that led him to see the necessity for museums of trade patterns, and the treatment his suggestions received from the authorities of South Kensington. "As the facts in connection with one's personal

experience are perhaps amongst the best arguments that can be used for the recommendation of any scheme, I may be allowed to explain that shortly after the alteration in the fiscal laws in 1860, being a ribbon manufacturer at Coventry, as English ribbons would not sell, and the workmen were standing idle for want of work, I was desirous of making certain kinds of trimmings, and, for this purpose, told my manager to get together all the old trimming makers he could find, and cause them to bring samples of anything they had previously made, with the view of starting something fresh. Accordingly, a number of old patterns were brought, but there was nothing to serve the purpose intended, and the great necessity for the existence of a trade collection of patterns, to which manufacturers and others might have access, then first struck me; for if I could have shown my weavers a collection of German and French trimmings, I could have indicated what I wanted, and have struck out something new. This conviction led me to make a move in endeavouring to originate museums of trade patterns, including raw textile fibres of the different kinds, &c., in this country, and, for two years, I had an office in Westminster-chambers, London, where I made a large collection of patterns of textile materials, which I offered to present to the Government, if they would begin the matter by making the attempt at South Kensington. I broached my scheme to the late Sir Henry Cole, and sent pattern-books to the South Kensington Museum to illustrate the method upon which I proposed to work, which was to have bits of textile materials exhibited in cases around the walls and upon screens, with folding leaves, by which an enormous variety could be shown in a comparatively small space, with numbers attached to each, duplicate pieces, with corresponding numbers, to be contained in the said books, which could thus be handled and examined at request. In recommendation of the scheme, accompanied by a deputation of Members of Parliament, the accompanying memorial was presented to the Lord President of the Council, on the 25th of March, 1867:—

To the Committee of Council on Education, Science and Art Department, South Kensington.

"We, the undersigned merchants, manufacturers, and others, having had a proposition brought before us, by Mr. Ablett, for the illustration of collections of patterns produced in the current course of trade and manufacture, desire to express to your Lordships our opinion of the great utility of exhibiting series of patterns, of foreign and home production, for the information of producers of all classes, whether employers of labour or artisans, not only in the metropolis, but in the great centres of industry in the provinces. And, considering that it is the special function of the Department of Science and Art to promote the education of the people, we desire to express a hope that your Lordships will see the propriety of, and even the necessity for, providing that such illustrations shall be collected and exhibited in the manner best calculated to afford practical information to all who are interested in the art, progress, and manufactures of the United Kingdom, with the view of stimulating an honourable rivalry in those branches in which we are excelled by our foreign competitors, which the opportunity of inspecting better specimens would tend to improve, and thus supply the missing link that is needed to connect the School of Art and Design with practical manufactures, and to complete the original plan of the late Prince Consort and the Exhibition Commissioners, to increase the means of industrial education, and to extend the influence of science and art upon productive industry." [Here follow the signatures of fifty of the largest wholesale houses in London.]

Nothing, however, came of this, for the matter was referred to the consideration of the South Kensington authorities, who decided they had not room for such a collection to be formed there. "Since the occurrence of the above, the suggestions have been acted upon abroad, whilst they have been almost entirely neglected at home. "Since the report of the Royal Commission on Technical Instruction was issued," says the writer, "it has been found that the museum of textile fabrics, at Mulhouse,\* contains a complete series of patterns, used in calico printing, from the commencement of the trade in Alsace in 1746, up to the present year. There is a permanent exhibition of historical specimens of ancient textiles in cotton, silk, and wool. The new patterns for each year are fixed up and labelled with the names of the producers, whether they be in France, Germany, England, or elsewhere. These designs are in due course removed in order to make way for newer ones, the older ones being mounted in books and catalogued. Those ranging from the year 1829 to 1858, which are considered worthy of being preserved, fill no fewer than 389 large volumes. The leading manufacturers are convinced of the beneficial influence of this museum upon the principal industry of the district. Some, indeed, went so far as to say that they could not see how trade could prosper without it. It is, they think, a source of inspiration to the designer; it sharpens the wits of the manufacturer, is a constant register of the relative progress of competing countries, and it gives individuals assistance in suggesting the adoption of old or historical styles to current wants." "During a recent visit to the Continent," says Professor Yates, of University College, Nottingham, "I paid special attention to these questions (i.e., Trade Museums), and had frequent conversations with the leading manufacturers in different towns concerning this subject. From Germany, through Austria, Switzerland, France, and Belgium, I have only heard one opinion: I was invariably told that the trade museums were not only a great benefit, but many men considered them indispensable." Such testimony, backed as it is by Mr. Swire Smith, Mr. Woodall, Mr. Wardle, and the Technical Commissioners as a body, should be the means of bearing fruit. Mr. Ablett further proceeds:—"Any person seeing an actual pattern or sample before him, would gain more positive instruction at a glance than many pages of written description would afford, while the opportunity of inspecting the best manufactures, that are produced abroad and elsewhere, would enable any short-coming to be detected at once, and allow of existing errors to be rectified through comparison, and, consequently, be the means of suggesting

\* We may here remark that Mr. Ablett was not aware of the Museum at Mulhouse until the appearance of the above report.



excellence in manufactures, that would in vain be sought for by any other method. That Englishmen are inventive no one can deny, and that much ingenuity and mechanical skill are often manifested by entirely uneducated workmen is equally plain. In every manufacturing town throughout the kingdom there lie scattered about, among the working population, samples or specimens of attempts at something different, either in the shape of new inventions or improvements, that have never had the opportunity of coming under the observation of those who could put them in a trade form, from the simple fact that there is no system by which these methods come under the notice of those most interested, excepting chance, or at rare intervals. But what we now want is a more diffused intelligence in the constantly occurring operations of every day life, by which, not only the skill and talent of the workman may be increased, but the mind of that workman may become more enlarged as to the object and application of his work, and its comparative excellence or defects, when placed side by side with other work. Now, no system at present exists for his being able to do this, except by means of those chance opportunities that are sometimes brought under his notice, in case of failure it may be; but if a museum of trade patterns existed, the germ of a good thought might become perfected, instead of dying away as it often does now; and ideas from other objects would suggest themselves, so as to form a complete whole of what otherwise would have remained undeveloped. It is generally admitted that, from our commercial activity, England has derived a great share of her wealth and position amongst the nations of the world, and that to manufacture was almost our necessity; and it would seem as if it were the destiny of Great Britain to clothe the teeming millions of the other portions of the world, and to receive in exchange the produce of other countries; but, according to the expressed opinions of a great number of eminent men, thoroughly well qualified to pass judgment on such matters, there exists at the present time the most imminent danger that England will lose the supremacy she has hitherto maintained over the rest of the world as a manufacturing nation, unless she girds herself up for the industrial race that she has to run in future with other kingdoms, which are now devoting more attention to the peaceful arts than they formerly did, and whose importations are competing with British manufactures even in the home market. In connection with this rivalry, it has been unmistakably shown that our successful competitors are found in those countries where the best system of technical education is in use—notably in France, Austria, Prussia, Belgium, Bavaria, and Switzerland—and the necessity that exists for the more efficient education of the masses is the great social problem of the future in this country. Assistance of the most valuable kind could be afforded to both artisans and manufacturers by museums of trade patterns, which would give an opportunity to all interested, in any particular branch of manufacture, to inspect samples of goods made abroad; this would go a long way towards affecting an improvement, as it would be the means of showing, in a distinct and positive manner, where we are excelled by our foreign competitors, and where our own great weakness lies. Not only would a collection of trade patterns have its due influence upon taste in a district, but it would positively give commercial information in the line of business a man was engaged in, by which he earned his daily living. He could handle the sample of his trade opponents, convince himself of the methods of manufacture pursued in other countries, see for himself how an article was started in a loom, or an object of metal cast; a glance, in short, would reveal what description of goods come against him in the general markets of the world. Thousands of workmen in this country see nothing else but their own productions and those of their fellows, from one year's end to another. If a plan of this sort existed in every manufacturing town, not only would workmen have an opportunity of seeing a full collection of all goods in their own line of business, both native and foreign, but they would see specimens of different goods, from which they would obtain ideas and originate new appliances of their own. If a plan was arranged by which any working man who had made any invention, or any new pattern, could exhibit it with his name and address attached, such a system would not only arouse the emulative spirit of the working classes, who would be anxious to exhibit, but it would gather together in one focus all the latent intelligence of that district, and masters could find ingenious workmen whom they never otherwise would have discovered, and the workmen find masters who would take up their inventions and carry them out to a perfected and successful issue, that never could have been arrived at, save for the mutual help rendered to one another. It must be borne in mind, that, for many years past, foreign nations have been making strenuous efforts, and sparing no expense and pains to fix some of the industries that have enriched England in their own countries, and, in some instances, they have succeeded to a remarkable degree. The broad silk trade of the country—that is to say silks for ladies' dresses—is entirely gone, and there are now no dress silks of any consequence manufactured in England, all the wide goods which are used, being sent to us from France, Germany, and Switzerland; and the importations of foreign manufactured silk goods amount annually to between £10,000,000 and £11,000,000. This branch is in a worse position than it is generally apprehended to be, inasmuch as, according to the Board of Trade returns, there annually appears to be a respectable amount of silk goods exported. But these, for the most part, consist of silks which have been imported into England from abroad, and are resold by wholesale houses to merchants in our Colonies, India, &c., and these figure as English silks, because they are sent out by English houses. The ribbon trade is dying out in Coventry, no lads being now apprenticed to the weaving business as formerly, though the classes of goods mostly in demand of late are of that description which comes best within the compass of what the English manufacturer can do, consisting mostly of union goods; for in all silk ribbons there is no competing with the Basle makers in the low-priced descriptions, nor with those of St. Etienne in the higher classes. As a counterpoise to this unsatisfactory condition of affairs, it is gratifying to be able to remark that a new branch has recently sprung up in this country in the form of spun and waste silk, in which we have so far beaten the foreigner; but it is impossible to say how long this fortunate condition of

affairs may last, for our trade opponents are both numerous and skilful, and soon adapt themselves to altered conditions. In the face of the opposition to which many branches of production are at present exposed, it has been often proclaimed that the wages of workmen must be materially reduced. But the proper thing to aim at, I take it, is not to grind down the wages of Englishmen to a continental level, but, by awakening their intelligence, and kindling their emulation, to raise the value of their producing power, which, most assuredly, can be done; and it is from a deep conviction that this is possible, that I have ventured to address you to-night; and my own experience has proved to me that one of the most lasting and surest methods of raising the skill of our workmen is by adopting the method of museums of trade patterns. I am firmly convinced that the future prosperity and welfare of this country will very much depend upon the working classes, and it will be to their advantage to endeavour to secure the adoption of every useful expedient that can be devised for increasing their own efficiency, and the value of their own exertions, for, as individuals become richer, the riches of a State also increase proportionately, and it is really imperative, for more reasons than one, that the importance of the plan that I advocate should be widely felt, known, and understood, for it will be found as practically useful to my fellow-countrymen engaged in manufactures, as the Sunday school scheme of Raikes proved to be to religious and secular elementary education. But it is a hard matter to produce an impression upon the British public, unlike the French, who are charmed with an 'idea,' and enthusiastically carry it out to its practical termination. There appears to be something in the peculiar character of Englishmen, that they never do their best until some strong opposition is brought to bear upon them, when the combative and persevering spirit of the nation seems to be brought out, and great improvement often results after a temporary collapse. If the State makes laws which permit manufactured goods to come into England duty free, it would be some slight concession and assistance. If the Government were to inform those manufacturers of the country, who have been the hardest hit by this arrangement, what goods come against their own in the markets of the world; and this could be done effectually through the instrumentality of these museums. And I would, therefore, suggest, in conclusion, that one should be established in London to serve as a model, and assist provincial towns desirous of establishing a museum of trade patterns of their own, which, of necessity, would be very varied in their aims and methods of management. To the parent museum, our consuls might furnish information and samples of goods that are either produced or wanted abroad, together with any details of a useful character which might afterwards be disseminated in the various producing centres of the country, which they would mostly concern. Such a museum could be begun at a comparatively trifling expense, and would gradually attain to very considerable proportions. A large number of valuable specimens could be obtained gratuitously from persons desirous of aiding the scheme, and they would be found to accumulate rapidly, and form a most valuable aid to the development of technical education and business knowledge of every description. The scheme, as advocated by Mr. Ablett, is one which, no one will deny, would be, of the utmost benefit to the manufacturing community but, perhaps, there is one apparently formidable difficulty to be conquered, viz.—the unwillingness of manufacturers to let their opponents gain an idea of what they are doing, there being a considerable amount of trade jealousy existing, which would not easily be overcome. And it is but natural that those who are engaged upon some speciality should prefer to keep it in their own hands. Still, perhaps, the difficulty is not so great as it appears at first sight, because any patterns would be comparatively easily obtained when goods reach the merchant's hands. Jealousy exists amongst manufacturers in this, perhaps, more than in any other country, and it is to this fact that we attribute, in no small degree, the little encouragement given to the proposal, made a few months ago, to establish a Textile Institute. We should be very glad to see this institute thoroughly established; and in connection with it in each manufacturing centre, museums of trade patterns flourishing. We shall be very glad to hear the views of manufacturers or others interested in this question.

### Cotton Manufacturing Abroad.

The competition we have to cope with in the cotton industry grows keener year by year, and there are signs that, if the trade in the United Kingdom is to hold its own in the future, the utmost energies of those interested, especially in the spinning and manufacturing departments, will have to be taxed. In France, Germany, Russia and other countries in Europe, the endeavours to oust our manufactures from the different markets are ceaseless, and, in India and the United States, we find that the competition costs us dearer as time rolls on. In this article we propose to deal with the cotton industry as it stands in India, the development of which is being watched keenly, not only by ourselves, but by other manufacturing nations. Thirty years ago, the making of cotton goods, as we now understand the term, had but little hold in India, but, about that period, merchants in England, and their agents in India, began to think seriously of establishing factories for spinning and weaving, and, after a few years, the movement assumed definite shape, and mills were erected, and the goods manufactured were found to sell fairly well. Of course, those interested had numerous difficulties—climatic and otherwise—to cope with, but these were, to a great extent, surmounted, and the produc-



tion of cotton goods was secured on a sound footing, so that, within a period of 20 years, the number of spindles in India exceeded 1,200,000. This was considered satisfactory. In the subsequent 10 years, ending 1885, the number of spindles increased nearly 100 per cent, so that at present they amount to nearly 2,200,000. This growth is something surprising and, in consequence of its extent, the production of yarn has considerably exceeded the demand for consumption, therefore, for some time past, the mills have hardly paid expenses, but, on the whole, the industry has not been a losing one during the last decade, as, in the earlier portion of that time, some of the concerns paid fairly well. But, if the trade in Indian mills has not been very satisfactory, it has not been worse than the same branch in our own country, and there is no reason why, if the industry should improve here, it should not also partake of the improvement in India. In the Bombay Presidency, there are about 70 mills, which contain nearly 80 per cent. of the spindles of the whole country, and it is from this district that in future the keenest competition will be undoubtedly felt. The yarns have hitherto been mostly exported to China and Japan, and the quantity sent to these countries has increased yearly. In the Bengal and Madras Presidencies, there are about 15 mills, and in the latter division, there is a prospect of more being erected. The exports have kept pace with the production, on the whole, both in yarns and piece goods, but the same cry has been raised as in this country, and, in fact, in other countries, that the prices procurable have not been remunerative, and that concerns have generally been running without profit for the past four or five years. We may ask ourselves what effect the erection of these mills has had on our cotton trade? And the answer will undoubtedly be that the result has been, to us, prejudicial, and is likely to be more so in the future, as, necessarily, for every mill that is erected in India, a loss in exports to us is certain, because she is enabled to compete more keenly with us, both on her own ground, and in countries in juxtaposition with her. In China, especially, she has coped with us, and her exports to that country have increased considerably during the past few years. New markets are being sought out by her, and efforts are energetically being made by the different joint stock companies that, as a rule, run the mills, to place the industry on a firmer basis, by making classes of goods which they have, for various reasons, before refrained from producing, but to which they are now turning their attention, being compelled to do so in order to work off the production of yarns, and to increase the output of the looms. Merchants and manufacturers, in England, have, for some time past, been anxiously watching the steady progress that has been made by the mills, and although the number, when placed by the side of that in this country may appear insignificant, still, we know to our cost that other nations on the Continent, and in America, began in the same small way, and are now in the van of progress with us; reasoning on the same lines, India is sure to make strides, if not so rapid as some of the countries named, yet such as will ensure her a large portion of the consumption of her own yarns and goods.

### Egyptian Textiles and Needlework.

Herr Theodor Graf, the Persian carpet merchant of the Schiller-platz, Vienna, has just completed a unique collection of Egyptian woollen and linen cloths. The Vienna correspondent of the *Times* gives the following description of the collection:—"It includes more than 300 specimens, dating from the fourth to the ninth centuries, and all in good preservation. The collection is for sale, and would be a useful acquisition for the museum of any city where cloth is manufactured. The specimens have almost all been excavated from tombs, and it took many years to collect, sort, and clean them. They are stitched on to large and small folios of cardboard, with fly-leaves to preserve them from dust, and every fragment can be easily and closely examined. Some of the fragments are only a foot square, but the larger specimens comprise an entire Roman toga, said to be the only one extant, with purple clavi, and a great many embroidered dresses. The collection is most interesting, as showing not only samples of cloth textures in every variety, but also of knitting, crewel work, and needlework.

### The Scotch Tweed Manufacture.

BY J. C. GOODFELLOW, HAWICK.



THE class of cloth which is now known over all the world as "Tweeds" is one which had its origin only about fifty years ago. Before that time, woollen cloth for men's garments was known as doeskin, kerseymere, pilot cloth, and by various other names. Generally, such cloths were of a close texture, and were made of yarns which had been firmly worked in the different processes of the yarn manufacture. To the touch—they felt smooth and firm, and gave, to those who handled them, the impression of strength and durability. These kinds of cloth are even now produced by some firms, although they are being gradually superseded by more modern classes of goods. The principal seats of the woollen cloth manufacture, from one hundred to fifty years ago, were Yorkshire and the North of England generally. It was in these districts that foreign wool was first used for the making of fine fancy cloths. It was mainly imported from Spain, Portugal, and Germany, for it was not until about the year 1811 A.D., that foreign wool was brought from Australia, Tasmania, and the Cape of Good Hope. A considerable difference in the quality and in the appearance of the goods produced was obtained by the introduction of the finer kinds of foreign wool; yet, while the principles of designing in relation to weaving had been known and applied to the production of variegated patterns in muslin, in linen, and in brocaded goods, as well as in all the various classes of carpets, the idea of employing the same, or a similar class of design, to woollen cloths seems never to have been entertained, either in the end of the last century, or in the first three decades of this. The principal features of gentlemen's woollen cloth then were cords, tweels, and plain cloths of small and unimpressive patterns. The variety produced was very limited in extent. Colouring, as an aid to design, was almost unknown. A large part of the cloth then made was self or solid in colour, that is, it was all of one shade. Drabs, browns, and dark shades of blues, violets, and greens, were the favourites, and the idea of even making striped cords seems not to have been entertained by the designers of these times. The change from such a class of goods to those now produced is so great that it is hardly possible to realise it. Instead of the hard, firm, closely woven, self coloured doeskin, pilot, or kerseymere, which felt like pieces of thick brown paper, we have now the soft, bulky tweed (which fills the hand as it is grasped), beautiful in design, and elastic as a piece of chamois leather, yet retaining, the while, all the characteristics which have gained for it a world wide fame and name. The progress of the cloth manufacture in this direction seems to have been greater in the South of Scotland than in any other part of the kingdom. In that country, the manufacture of plaids and tartans early attained considerable importance. But whilst the production of checked goods was carried on in various localities, it was reserved for the town of Galashiels to succeed in the making of tartans of really exquisite design and manufacture. The goods woven in Scotland were, however, almost all made from home grown wool, and very little foreign was used until after the year 1830, either in Galashiels, Hawick, or elsewhere. The main reason for the foreign kinds not being used was that the process of working them was very imperfectly understood by the carding masters of the various factories. The home grown being much more easily broken up by the carding machines, received more attention than the foreign wools, and the class of thread produced by the Scotch yarn manufacturers has always been of quite a different kind from that of English yarn producers. English yarn has, for the last fifty years at least, been very much better worked in the carding machines than either Scotch or Irish yarns. For smoothness, firmness, and equality throughout, that turned out of the carding establishments in Yorkshire can vie with any produced in Great Britain or on the Continent of Europe, although, of late years, the Belgian yarn manufacturers have succeeded in producing a cheaper article of almost equal quality and character. There is, however, a considerable difference between the class of cloth made in Scotch factories now compared with that produced twenty-five years ago. Then, although the yarn was neither so smooth nor so regular, it was, as a general rule, made of better



qualities of wool. The quantity of wool imported from Australia, the Cape of Good Hope, and South America, was then very small compared with what it now is, but the increased demand all over the Continent and elsewhere for Scotch tweeds has caused manufacturers to dilute, as it were, the good wool with inferior qualities; and while, to many, the difference thus caused in the feel and the look of tweed cloth is not perceptible, least of all to those who merely buy to sell again, it is quite easily detected by those who have had experience extending over thirty or forty years. The deterioration of the material has been so very gradual, and the skill employed in the manufacture, in order to hide the deficiency, has been so highly developed, that it is almost impossible for the unpractised to say where the difference lies. In durability and in look, however, the tweed cloth of the present day far outstrips that of any former period. Of course, this must be taken in connection with the cost of production, which, owing to the great advance made in machinery, and in the economising of motive power, as well as in the utilisation of waste products, and in the better and more improved methods and processes of the art of manufacturing, has greatly tended to reduce the rate at which goods could be produced. Yet, whilst in look and in strength the tweed cloth of the present eclipses that of the past, it lacks the rich and buoyant qualities which, thirty years ago, caused woollen manufacturers all over the world to be so very anxious to become acquainted with the methods by which such excellent results were obtained. It was qualities such as these that gained for Scotch tweeds the high encomiums passed upon them at the exhibition of 1851. The impetus given to their manufacture by the success of exhibitors in gaining medals and honourable mention at that exhibition stimulated, in a great degree, the woollen trade of the South of Scotland, and, although in 1854 and in 1855 a depression was felt, owing to the slackness of trade, caused by, and consequent on, the Crimean War, yet there was less distress experienced there than in many other manufacturing localities.

### A New Cotton Bleaching Process.

Nearly two years ago the attention of our readers was drawn to a new bleaching process, the invention of Mr. J. B. Thompson, by means of which the time occupied in bleaching was very materially reduced, a great reduction being effected in the wear and tear of the material under treatment. The process had then passed the experimental stage, having been proved on a practical scale at the Halliwell Bleachworks of Messrs. R. Ainsworth, Son and Co., near Bolton. Since that time, however, the method of conducting the process has been materially modified and improved, although the principle remains the same. The improvements are due to Mr. William Mather, of the firm of Mather and Platt, of Manchester, who has engrafted, upon the chemical principles involved, a mechanical method of treatment which would appear to render the system perfect. In order fully to understand the value and importance of the new system of bleaching, it will be well here to indicate the chief features of the old or ordinary method, and of the new one. For "market" or "white" bleaching, the ordinary system involves eight treatments with reagents, with attendant washings; the cloth being actually in work during forty hours. In the Mather-Thompson system, the process is continuous, and the cloth is actually in work during twelve hours only. The first part of the Mather-Thompson process is the steaming operation, which advantageously supersedes that of boiling in ordinary practice. The successful working out of this part of the process, by those who had the conduct of its development, has been of the utmost importance in giving a maximum efficiency to the subsequent chemicking process, which is Mr. Thompson's original invention. For steaming, the cloth is first saturated with about twice its weight of a dilute solution of caustic soda at the boiling temperature. It is then piled in an iron cage-like waggon, holding about a ton, and rapidly transferred to the steaming kier, which is an iron cylinder, placed horizontally, and having a close-fitting valve-door. The kier having been charged, and the door closed, steam is admitted at 4lb. pressure, and the charge remains in the kier, under this treatment, for about four and a half hours. At intervals during this period, a solution of caustic soda, in the form of spray, is admitted into the cloth from the top of the kier, and runs off below. The four and a

half hours' steaming having been completed, a powerful wash in hot water is given to the cloth, by means of a circulating pump, before it is removed from the kier, so that only a slight rinse through cold water is necessary on removing the cloth from the waggon, previous to its subsequent treatment in the bleaching-powder solution. In the earlier development of the bleaching or whitening process by Mr. Thompson, the chemicking and the souring operations were conducted alternately in the same kier, the acid used being carbonic acid gas. In the Mather-Thompson arrangement a series of vessels are used, and the process is continuous throughout. The waggon, or cage of cloth, having been brought from the steaming kier to the range of vats, the cloth is led under and over rollers by means of india-rubber tapes, through the whole series. It first enters the acidulated hot wash, which consists of a weak solution of hydrochloric acid. It then passes through the chemicking vat containing a solution of bleaching powder. Thence it is conducted through the gas chamber, where it is subjected to the action of carbonic acid gas. It now enters and passes through a vat containing clear water on its way to the next vat, which contains a boiling, highly dilute, solution of carbonate of soda. Here it gets what is known as a soda scald, and then another wash in clear water in the next and final vat of the first series. A second series of vats is provided, through which the cloth may, or may not be passed, as may be desired. This second series consists of a chemicking vat, a gassing chamber, a washing and souring vat. In these, the treatment is conducted with weaker agents than in the first series. It is to be observed that the first sour and the finishing sour are subsidiary processes, and can be conducted separately if desired. Such, then, is the Mather-Thompson bleaching process, which is in full and regular operation at the Halliwell Works. The major advantage is that the cloth goes through a sequence of processes, each of which is full and adequate, thus avoiding the repetitions of the ordinary system. The great advantage to a practical bleacher is that the cloth is returned bleached from the croft within twenty-four hours of its being received, and, under pressure, this can be reduced to twelve hours, as against from two to four days under the ordinary system. Another most important point is the economy of water. It is estimated that by the new process a saving of 80 per cent. is effected in water consumption upon that used in ordinary bleaching practice. The importance of this will be realised by those who have a knowledge of water rights monopolies in the bleaching districts.

### Waste in Power.

"With high speed machinery," says the *Boston Journal of Commerce*, "and shafting driven at three hundred turns per minute, it takes but a small resistance to waste a large amount of power. A load of only ten pounds on a three-foot wheel will call for one-horse power from the coal pile, and a light belt left dragging on the pulley will offer more than ten pounds resistance. The Emerson power scales were recently applied to a pulley where the belt, when thrown off and hung up out of the way, would rest on a short arc on the driving wheel, and it was found that this pulley required more power than was used on the machine it drove, when the belt was in motion. Leather has a wonderful clinging tenacity, and wherever it is allowed to drag on the frame work or guide bars, or in some of the belt holes when the belt gets slack, more or less power will be absorbed, though the wear of the belt may not be noticeable. We have seen the set screw of a pulley slip, and draw the shaft along in the bearing, till one of the larger wheels rested against a floor beam, the rim cutting into the wood, and the beam making use of the friction break in absorbing power, till the line of shafting was brought into place. Belts that have been over-stretched by having more work to do than they are able to manage, are not apt to run true on the pulley, and where the face of the wheels are no wider than the belt, they must not run very close to the frame work, as the projecting edges of the belt may strike, and offer a large amount of resistance. When there are indications of frictional resistance, by the room becoming filled with the fumes of belt grease, there is a chance for some one besides the fireman to make a saving in coal, if it is nothing more than to remove the oiler's ladder that is grinding its way into the space between the fly wheel and the brick work."

## ORIGINAL DESIGNS.

Our first plate consists of a design for a Curtain: this also forms the first plate of "Modern Ornamentation," reviewed in the paragraph which will be found below. Through the courtesy of Dr. Dresser, we are enabled to present this design to our readers.

On our second plate will be found a design for a Lace Curtain, which has been drawn by Mr R. T. Lord, 10, Ann Place, Bradford. The pattern shows one-half the width of the curtain, as it repeats from the centre. This should be acceptable, as it is in a style now much in favour.

### Modern Ornamentation.

The above is the title of a new work, by C. Dresser, Ph. D., which is being published in ten monthly parts, at three shillings and sixpence each part. Modern Ornamentation consists of a book of decorative designs, chiefly for fabrics, either figured by weaving or by printing—such as carpets, lace, embroidery, linoleums, oil-cloths, &c. Each number consists of five finely executed plates, many of which contain several designs, in the styles of the great historic periods, such as Egyptian, Greek, Arabian, Japanese, Gothic, Renaissance, and other well known styles, whilst some are new in character. Parts No. I. and II. have been published, and, judging from their contents, we have no hesitation in saying, that if the standard of these be maintained in the following parts, the complete work will form one of the cheapest and best collections of designs we have lately seen. From the ten plates before us, we have selected one, consisting of a very pleasing curtain design, and this we publish as our first plate for this month. There is no necessity for us to say anything in reference to it, as it speaks for itself. Orders for the work should be forwarded to us. For further particulars see advertisement.

## MONTHLY TRADE REPORTS.

**Wool.**—At the London Colonial wool sales, which opened on the 19th of last month, and closed to-day, competition has varied but towards the close of the month a fair demand was experienced for most classes, and prices were very firm. In Bradford, the demand has been fairly brisk at hardening rates, and there has been a moderate speculation. Botany wools were in good request, and cross-breds have met with increased attention. Spinners have been generally busy on orders, and for new inquiries they demand an increase in rates. Curled, and such like fancy yarns, still meet with much attention. The piece trade has been in a slightly more satisfactory condition, although the home demand is still disappointing. There have been many inquiries from America, and a fair business has resulted. Continental inquiries, as a rule, have resulted in little or no business. The least satisfactory aspect of this branch is the unremunerativeness of the trade, in consequence of the dearness of yarns, which are somewhat out of proportion to piece goods.

**Cotton.**—Spinners, although they have had to give a shade higher prices for the raw material, have produced yarn in such quantities that there are good stocks on the market, and therefore prices have given way. This fact has put manufacturers in a rather better position than they have been for some time past, and piece goods have consequently sold more freely. There has been a fair demand for the finer qualities of yarns, but other sorts have been neglected. The sales of cloth for the East have improved to a moderate extent, and the prices procurable have been more satisfactory than for some time past. Still, there is much room for improvement in every respect, although manufacturers generally are looking to the future more hopefully.

**Woollen.**—The cold weather that has recently been experienced has had a beneficial effect on the demand for the heavier kinds of cloths, and stocks have been considerably

lightened. The finer makes of worsteds still meet with a good deal of attention, and the fancy tweed branch has kept moderately brisk. Small, neat patterns, in good colourings, both for ladies' and gentlemen's wear, have met a good demand. In the shipping branches, orders have increased, especially for America and our Colonies. In Scotland, a fairly active business has passed, and the outlook for the future seems moderately good. The lower classes of goods have sold on about the average of the past six months, but medium qualities have been rather neglected.

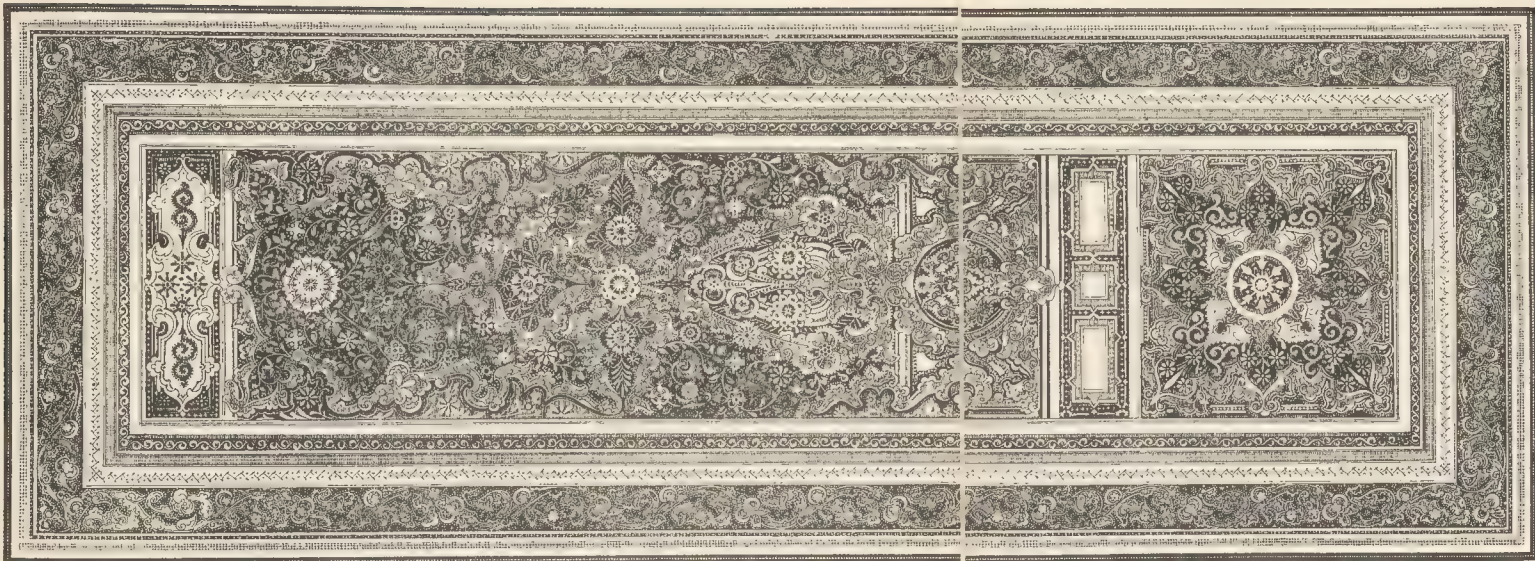
**Linen.**—This branch has been rather quiet during the month, and prices have ruled against manufacturers of most classes of goods. In many linen districts short time is the rule, although there are two or three exceptions, where certain firms are fairly well in hand with orders. The flax branch has shown a rather buoyant tone recently, and prices have risen. The prospects of this trade are much brighter than they were recently.

**Lace.**—The curtain departments have been rather busier than for some time past, as an improved demand has been experienced, although much machinery in this branch is still idle, and to set it running large orders will have to be received. Prices are much against producing this class of goods, as large sums are spent yearly on the making of new designs, &c., which fail to meet with the reward deserved. Silk guipure laces and nets seem as if they would meet with a demand during ensuing seasons, as many inquiries have been made for them, and manufacturers are issuing really excellent patterns at fair prices. Cotton laces for millinery purposes have had a dragging sale, and prices show a downward tendency.

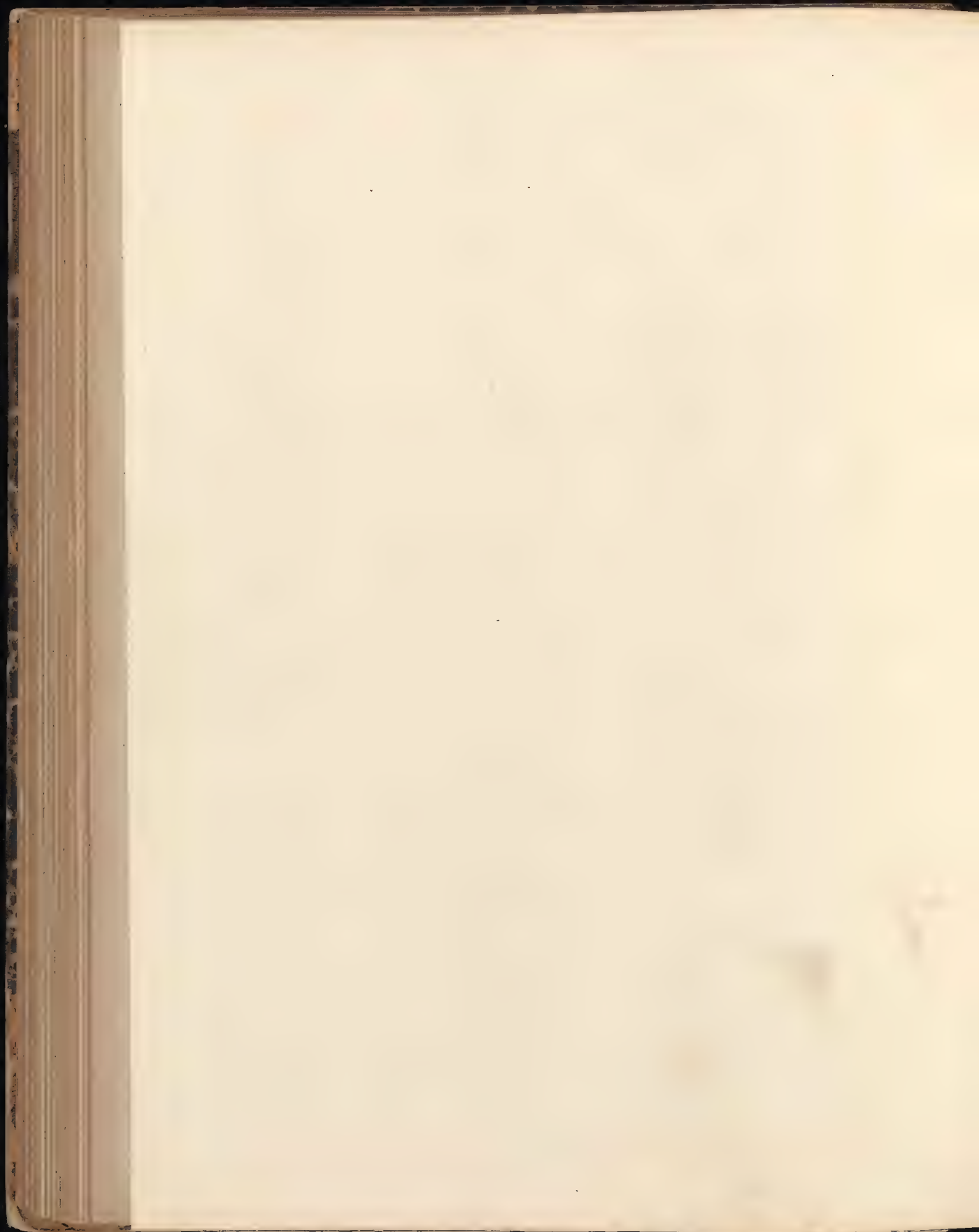
### The Board of Trade Returns.

The *Economist* says:—"As regards the imports during the past year, both our importations and our exports of imported goods have fallen short of the previous year; the former by nearly £16,000,000, and the latter by £5,000,000, leaving our net purchases less by £11,000,000. This sum is the difference between £19,000,000, saved to us by lower prices, and £8,000,000, the equivalent of the larger quantity of goods we have imported and retained for home use. For 1884, the account showed £33,000,000 less expenditure, of which two-thirds arose from diminution in value and one-third in volume. Of last year's shrinkage, only £1,000,000 was in truly consumable articles, because, though we saved £13,500,000 in the cost of these, we took £12,500,000 more in quantity. For the previous year, almost the whole saving lay in this direction, more than £31,000,000 having been almost equally divided between prices and quantities. It thus happens that our food consumption in 1885 having in quantity so largely exceeded that of 1884, and by some £4,000,000 the whole excess in the volume of its own year, there is a corresponding decline in our demand for materials, which are the staples of our national industries. This has fallen with peculiar severity upon our importations of textile substances, the whole value of these we have retained at home being £53,000,000, as against £64,000,000 in 1884, of which diminution £9,000,000 has to be set down to a contraction in volume, and but £2,000,000 to a fall in price. In 1884 there was an increase in the quantity of these articles taken for use to the value of £2,000,000. As regards the exports, the total diminution in the value of our sales for 1885 has been £20,000,000, a fall of nearly 9 per cent., of which £11,000,000 arises from the prices received being less, and £9,000,000 from the quantities having been smaller. Of this £20,000,000 fully £8,500,000 has been sustained in our textile manufactures, and £8,700,000 on our mineral productions, leaving about £3,000,000 of decay in all other articles. For 1884 the diminution was below £7,000,000; nearly £4,000,000 arose on minerals, and £2,500,000 on textile manufactures, leaving but £500,000 for all other goods. Of our loss in 1885 of £8,500,000 on textile manufactures, £5,500,000 was in price and £3,000,000 in quantity. In 1884 prices lost £1,500,000, but quantity recovered £2,000,000. Of the nearly £9,000,000 by which our mineral exports have suffered, almost £5,000,000 arises from price, and £4,000,000 from quantity. In 1884, of £4,000,000 short altogether, but £500,000 was from lesser quantity, the larger sum of £3,500,000 being in price."



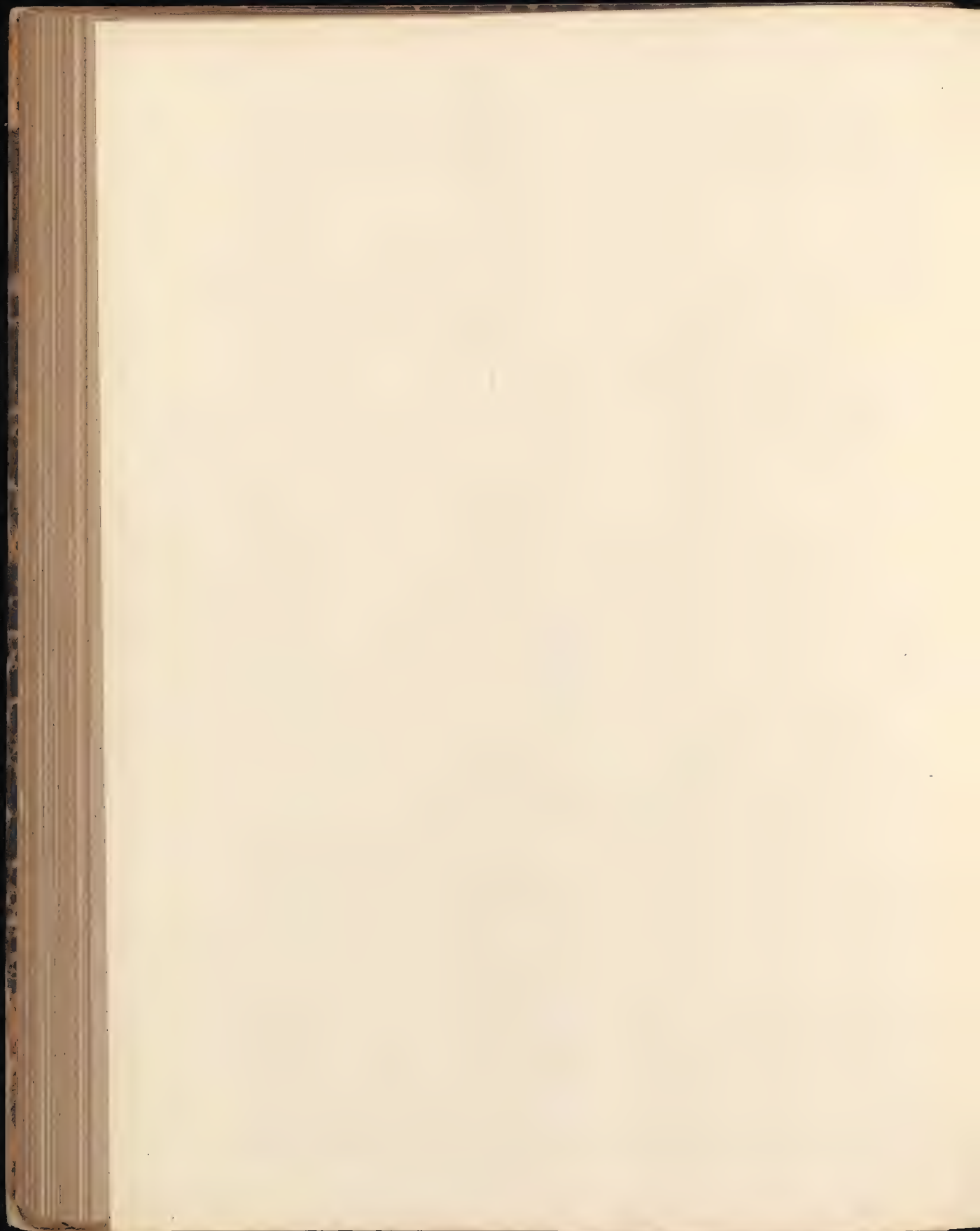


CURTAIN.







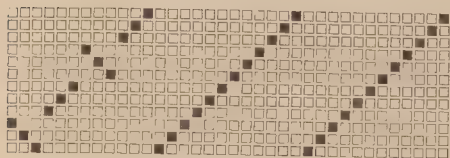






### Chebiot.

No. 335.



Draft.



Pegging Plan.

#### Warp :

6 very dark Olive and Old Gold  
1 Black and Scarlet.\*  
5 Black.  
6 very dark Olive and Old Gold.  
1 Black and Blue.\*  
5 Black.

#### Weft :

6 very dark Blue Green and Plum.  
1 Black and Orange.\*  
5 Black.  
6 very dark Blue Green and Plum.  
1 Black and Scarlet.\*  
5 Black.

1200 ends.  
32 picks per inch.  
3 ends in a reed.  
36 inches wide in the loom.  
28 " when finished.  
Finish not too clear.

Warp and weft :  
375 yds per oz. twisted.  
\*500 " "

### Saxories.

No. 336.

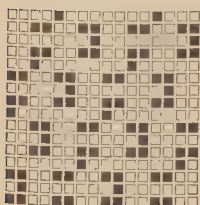
#### Warp :

4 White, 2/36s worsted.  
4 Pale Blue, 2/36s worsted.  
8 Moss Green woollen, 1000 yards per oz. twisted.  
4 White, 2/36s.  
4 Pale Blue, 2/36s.  
4 Olive Brown woollen, 100 yards per oz. twisted.  
4 Scarlet " " "

#### Weft :

6 Dark Fawn woollen.  
4 Bottle Green "  
2 Russett, 2/36s. "  
6 Dark Fawn woollen.  
2 Bottle Green "  
2 Scarlet, 2/36s.  
2 Russett, "

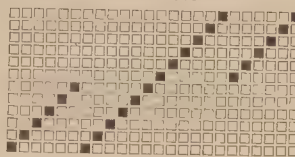
3260 ends.  
48 picks per inch.  
8 ends in a reed.  
34 inches wide in the loom.  
28 " when finished.  
Natural finish.



Draft.

Pegging Plan.

No. 337.



Draft.



Pegging Plan.

#### Warp :

3 Black.  
3 Olive Brown.  
3 Black.  
3 Mid Indigo.\* Blue.  
3 Black. } 12.  
3 Olive Brown. }  
3 Black. }  
2 Mid Indigo.\* } 12.  
1 Black & Blue Green.\* }

Weft: Same as warp, but Olive Green for Indigo,\* and Black and Crimson for Black and Green.\*

750 yard per oz. twisted very hard.

2240 ends.

64 picks per inch.  
6 ends in a reed.  
35 inches wide in the loom.  
28 " when finished.  
Bright smart finish.

### Woods.

No. 338

#### Warp :



Pegging Plan.

6 Black.  
6 Red Fawn and White. } 44.  
6 Black. }  
6 Green Sage. }  
4 Scarlet. }

#### Weft :

6 Black. } 44.  
6 Cream. }  
6 Black. }  
6 White. }  
4 Scarlet. }

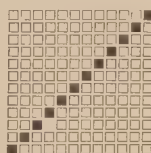
1160 ends.

Warp and weft :  
375 yds. per oz. twisted.  
Well milled up before raising.  
Pile not too long when finished.

81 picks per inch.  
4 ends in a reed.  
35 inches wide in the loom.  
28 " when finished.  
Melton finish.

No. 339.

#### Warp :



Draft.



Pegging Plan.

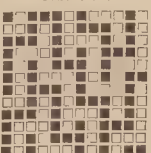
1 Scarlet, 375 yards per oz. twisted.  
6 Black, 186 " "  
1 Scarlet, 375 " "  
1 White, " " "  
2 Lavender, " " "  
1 White, " " "  
2 Old Gold, 186 " "  
4 Black, " " "  
2 Old Gold, " " "  
1 White, 375 " "  
2 Lavender, " " "  
1 White, " " "

1160 ends.  
30 picks per inch.  
4 ends in a reed.  
38 inches wide in the loom.  
28 inches wide when finished.  
Natural finish.

### Coating.

No. 340.

#### Warp :



Design.

8 Black.  
8 Cigar Brown. } 2/40 skeins warp and weft woollen.  
16 ends.

72 ends per inch.  
72 picks "  
18's reed.  
4 ends in each split.  
72 inches wide in the loom.  
56 " when finished.  
Fine drawn finish on the vegetable teazle.



### The American Power Loom.\*

BY ROBERTS BEAUMONT.

(Concluded from Page 8.)

There are certain other specialties about the loom, such as the open shed arrangement, and the contrivances for reversing the head gearing and for levelling the healds, which merit a passing word.

**I. THE OPEN SHED MOTION.**—This style of shedding implies that, when a shaft has been elevated or depressed, it will remain in that position, pick after pick, for any length of time required. On the closed shed principle, the healds are levelled after the intersection of each pick, and the shed is formed from the centre; that is, if a shaft had been depressed, and it afterwards required elevating, it would, in the first place, have to be brought to the centre, and then lifted; the motion, in reality, being of a two-fold character. Here, however, whether a shaft were down or up, it would be elevated or depressed at one movement, so that, in this particular, open shedding has an advantage over closed shedding, inasmuch as it saves time in the forming of the sheds. Other advantages, resulting from

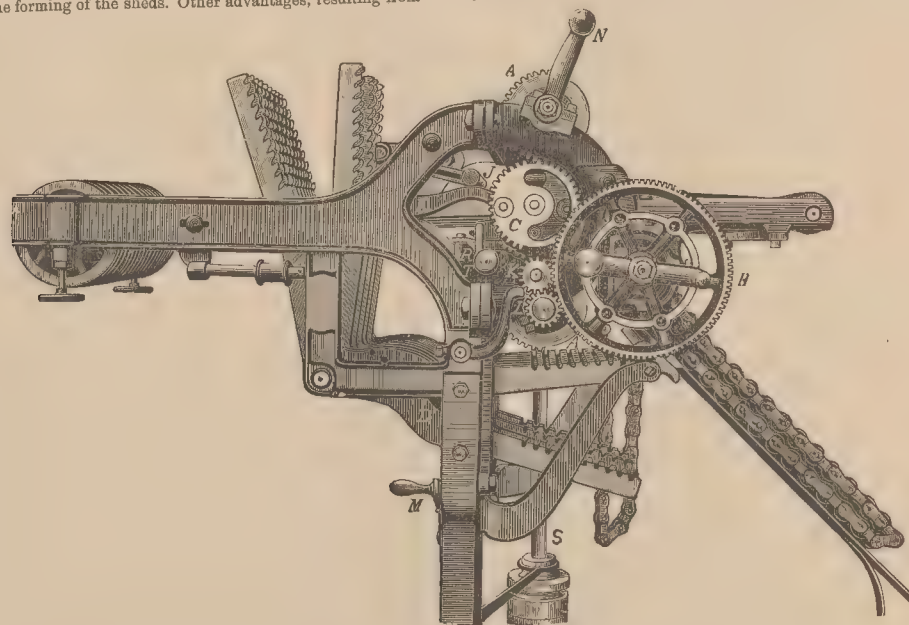


Fig. 5.—Head Gear of the Loom.

the use of this kind of motion, are said to be less strain and friction on the warp, thus affording improved facilities for weaving tender and twitty yarns. The principal appliance to be considered in connection with this arrangement is the holding-up bar or lock knife, shown at R. Fig. 6. This part, by means of an eccentric, is pressed from the vibrator levers when the healds are being operated upon; but, before the bowls or "risers" are removed from underneath the levers by the motions of the pattern chain, it is brought against the grate, in which the latter are kept in position, and thus it preserves the exact arrangement of the shafts in the last shed, until the rolls and tubes of the succeeding rod have taken up the position of their predecessors on the chain shaft. The lock knife R. is shown in the figure, when held against the grate, or, in position, when maintaining the order of the shafts in the shed last formed.

**CONTRIVANCE FOR REVERSING THE SHEDDING APPARATUS OR HEAD GEARING OF THE LOOM.**—The practical value of a motion of this character can only be understood by those who have had, when weaving, to pull back and to find a certain broken pick. Without an arrangement for reversing the movements of the machine, the weaver, in such an instance, would be under the necessity of turning the pattern chain round and round until he found the shed required. In looms supplied, however, with this mechanism, he has simply to reverse the shedding and other motions and lag back to where the damaged or broken pick was inserted. The readiness with which

this can be effected in this loom is a feature that ought not to be overlooked. As the shed, pick, and box movements are all worked by one shaft, it is accomplished by reversing its motions. Thus, the mechanical contrivances are such that when the coupling S. Fig. 5, of the upright shaft has been disconnected by moving the lever M. and the knob at the centre of the wheel drawn out, the small pinions K. and L. then reverse the motions of wheel H. on the end of the chain shaft, and, in this manner, the pattern chain is made to travel backwards by turning the handle N. forwards.

**CONTRIVANCE FOR LEVELLING THE SHED.**—A very considerable drawback to open-shed looms has been the difficulty attending the piecing of the broken ends of warps, with a formed or open shed. Some loom makers saw this difficulty several years ago, and supplied motions to their looms for bringing all the healds on one common level, when required. It is to this apparatus that we wish briefly to refer. It consists of the flat piece T. Fig. 5, and is fixed under the front end of the vibrators on to the grate, being called the eveners slide. When this slide is drawn out, it raises the vibrator gears above the teeth of the low cylinder, so that by turning over the upper gear, all the harness is elevated or brought on to one level, admitting of threads being repaired with as much ease and comfort as in the closed shedding loom. There are other features of practical importance about this invention, which might possibly have been aptly referred to, such, for example, as the manner in which all the parts are connected positively together, so that,

when turning back for a lost or broken pick, the boxes, the shed, and the picking motions always correspond exactly at every point, allowing the loom to be started right away on the fault being repaired; but at present we must not enter into further detail. We can only add that, for many classes of goods, it will possibly ultimately prove to be a very efficient and valuable invention; for its weaving capacity, running speed, the simple means by which the latter may be regulated, as well as its various motions adjusted, are all features of practical and mechanical value calculated to obtain for it an increasing sale. Considering the important position which the loom now occupies in the factory; that very much of the saleable value of the goods produced depends on its perfect movements; that the expedition with which it performs its task regulates, to a considerable extent, the price of the woven article; there can be no doubt that manufacturers will, in the future, pay even more attention to the capabilities of weaving machinery, than they have done in the past; for, if the loom department of the mill is suitably and judiciously furnished, it affords many advantages in the production of woven fabrics, thus assisting the textile fabricator to cope with the varied exigencies of the trade.

Experiments have been made by Liebermann, who states that cochineal does not contain more than 10 per cent. pure colouring matter. Cochineal carmine is a kind of lake very similar to turkey-red lake, and contains a large amount of alumina and lime combined with nitrogenous matter. A commercial sample of very good quality was found to contain 17 per cent. water, 20 per cent. nitrogenous matter, 7 per cent. ash, and 56 per cent. colouring matter.

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## MACHINERY, TOOLS, &C.

### Textile Fabrics.—Woolen, Cotton, &c.

A patent has been granted for an improved manufacture of textile or other fabrics, with designs or patterns marked thereon, to facilitate the cutting of garments out of the fabric. According to this invention, textile or other fabrics are marked in the piece with the designs or patterns of wearing apparel, or other articles, to be produced from the fabrics, so that the pieces contain, when purchased, the necessary patterns or designs of the articles which the purchaser desires to produce. Thus, a piece of woolen or cotton fabric has printed upon its entire length the patterns required for the parts marked, being the patterns of the several parts of the clothing. The fabric may, for this purpose, either be printed with consecutive sets of complete patterns for a coat or suit, &c., or separate pieces of the fabric may each be printed with repetitions of one and the same pattern, so that there are as many separate pieces of fabric as there are patterns required. The first method is more suitable for retail commerce, where a purchaser, only requiring to produce a single garment, obtains all the patterns he needs on one piece, by taking a length, so that, by cutting this out along the lines marked, he will at once have all the patterns necessary to produce the garment. The second method is more suitable for the wholesale manufacture of wearing apparel or other articles, and, with it, the advantage is gained of enabling each piece of fabric to be manufactured of a special width, suitable for the particular pattern to be marked upon it, so that it will cut up without waste of material; or the fabric may have such of the several patterns marked upon it as will enable it to be so cut up. The marking of the patterns on the fabric may be effected in a variety of ways; thus the necessary lines may be produced in weaving, or by printing in colours, either by means of cylinders or by flat plates, or they may be burnt in by means of highly heated metal surfaces with the pattern lines in relief thereon. Again, where the surface of the fabric is wholly or partially covered with an ornamental design printed, or otherwise produced upon it, this design may be so arranged that its position on the fabric will indicate the lines on which the cutting has to be effected, without the necessity of marking the lines themselves.

### Apparatus for the Manufacture of Fabrics for Overcoatings, Shirtings, Shirtings, &c.

The object of the above invention is to provide an improved machine or apparatus, by means of which wool or other fibre, without its being made into yarn, can be incorporated with jute, cotton, or other fabric, so as to form virtually a part of it, and to give the appearance and, in great measure, the utility of woollen goods made in the ordinary way. In carrying out this invention, the fabric to be treated is wound on a roller, and means are provided by which it is conveyed, by carriers, so as to impart to it the necessary tension, in proximity to a series of needles or piercers, and upon this fabric loose wool or other fibre is placed, it preferably being led in a continuous layer along with the cloth. The frame, carrying the needles, has a reciprocating up and down, and side to side, movement imparted to it, so that the needles penetrate a great number of times, but at different places, through the layer of wool or other fibre and the fabric beneath; the needles being constructed in such a way that they take down, at each downward movement, some of the woollen or other fibres, so that they are passed partly through the fabric beneath, (of which they then form part) the ends of the fibres projecting from each side of the fabric, by which, when the fabric is completed, a cloth, having the appearance of a good woollen cloth, is produced. The needles are preferably operated to and fro laterally by a cam with a number of throws, preferably three, so that they penetrate the cloth a great number of times, and give a very complete incorporation of the fibres with the fabric. The needles are made in an improved manner, so that they effectually take down the fibres into the fabric, but so that, on their return movement, they do not disengage the fibres already taken down. This is effected by cutting out of the substance of the needle, triangular gaps, in cross sections, so as to form ledges or barbs (three at each angle to be preferred) presented downwards towards the point of the needle; these ledges engaging with the fibres, and carrying them into the fabric as the needles penetrate it; but, on the return motion, the fibres are not acted upon by these ledges, they having, on their opposite parts, inclined surfaces, which allow of the needles leaving the fabric without injuring its threads or interfering with the fibres, as there are no projections from the general longitudinal lines of the outside of the needle.

### Improvements in the Treating of Fibre for Textiles.

Mr. Wesley W. Hamilton, of Brooklyn, N. Y., has recently obtained several patents in the United States and in foreign countries, for an improved process of treating animal and vegetable fibres, whereby many such substances, heretofore unavailable, may be made suitable for textiles, cordage, upholstery purposes, and numerous other uses. It has, heretofore, been found impossible to spin jute and flax, when reduced in length to about that of cotton fibre, on cotton or wool machinery, whether it has been alone or mixed with some other short fibres. At the first part of the American civil war, it was especially sought to more largely utilise flax in England, and by

splitting up its fibres with acids and alkalies, to make them more nearly resemble cotton; but the flax fibres remained in the end only straight, solid pieces, destitute of the curliness, softness and pliability characteristic of cotton. During the past fifty years, many patents have been taken out in America and in Europe, but more especially in England, to render the short fibres of flax and jute capable of being spun, the same as cotton and wool; but they have all failed, because they have not imparted to the fibres the softness, pliability, and clinging curly form always found in cotton and wool. By this invention of Mr. Hamilton, it is claimed that all previous difficulties of this nature are obviated, not by the use of chemicals, which would impair the strength of the fibre, but simply by mechanical pressure and heat, and by an operation which can be effected at very slight cost. Mr. Hamilton has been for several years engaged in perfecting his invention, which has not yet been employed in any manufacturing industry, but he has samples of a great variety of fibres thus treated, which show a wonderful transformation in what are usually considered the most intractable of fibres. Of calf, cattle, and goat's hair, white and dyed, all his samples show decided woolly qualities, some of the calf's hair being in such a condition that it would require an expert to separate it from a fine sample of wool. Coarse and fine jute, and flax, cut in lengths of one and two inches, are shown in a form very much like wool, and which, undoubtedly, admit of their being easily spun, either alone or with cotton or wool; while thistle and cocoa-nut fibre, hog hair, and many other similar substances, are presented in a curled form, which adds largely to the variety of uses to which they may be applied.—*Scientific American*.

### Ruled Paper Drafting.

The drafting of designs upon ruled paper is, in many branches of the textile trades, a somewhat difficult operation to thoroughly master. The best draughtsmen, perhaps, are those engaged in the carpet trade, as the variety of colours used, and the manipulation of them, are much greater than for any other fabrics. Carpet designers have, invariably, had some experience in freehand drawing before engaging in the profession, and are, as a rule, masters of the art ere they can be legitimately considered designers. Designers of tapestry hangings, damasks, and such like fabrics, may be almost classed with their brothers of the carpets, because they must utterly fail, in their particular branch, unless they have ability in freehand drawing. But they are not so much troubled in the matter of colour as the carpet men, and, indeed, we may say, not at all as regards damasks—one colour only being used to indicate a pattern. In tapestry fabrics, several colours may be employed, but these are much easier to manipulate than those in carpets, as much more scope is given in the number of warp threads required to make a pattern of a given size when woven. As an evidence of this, take a design for a Brussels carpet and one for a tapestry fabric. In the former, the number of warp threads allowed to produce a pattern, three-quarters of a yard wide, ranges from 216 to 256 or 260, according to the quality of the carpet—the latter numbers being employed for the best qualities. Now, for tapestry, the pattern of which is but six-and-a-half inches in width, the warp threads may not number less than 300, and these range higher according to the pattern produced. Therefore, it is much easier to correctly draw a design upon ruled paper for tapestry fabrics than for carpets, as the size of the latter pattern, when woven, more readily shows defects in drawing than in the former; and again, a carpet designer will often be required to invent a design and draft it straight upon the point paper, with only his imagination to draw upon; or he will have a small sketch to copy fairly. Still another difference appears in tapestry fabric drafting. In all cases, a sketch is first made, cloth size, which, in drafting on the ruled paper, is many times enlarged. These particulars may, perhaps, be interesting to those of our readers who are not conversant with the subject, and in dealing with which, we most particularly wish to mention some branches of designing in which, before embarking, a fair degree of efficiency in freehand drawing should be acquired. We have already mentioned those designers who must be proficient in this respect, and of them we need say no more. From a long experience, we are led to believe that designers of dress fabrics are deficient in drawing, but, in saying this, we must, in justice, be ready to make exceptions to the general rule. Then, there are designers of a variety of fancy fabrics, apart from dress goods; these gentlemen must be qualified in the matter of satins, twills and the various details which govern their operations, but there is frequently a lack of symmetry in the formation of their patterns, consequent upon defective drawing. However good the "motif," the pattern will be rendered an abortion when completed, if what should be a graceful curve appears with



a broken back. Such a defect can only be remedied by good drawing, and this can only be acquired by practice. We have known designers, good in a particular branch, not immediately requiring any efforts in sketching, who, when the exigencies of trade caused a sudden change in patterns, were completely non-plussed for want of experience in this. Therefore, it would be better for all designers alike to have good practice in this respect, for, otherwise, no ornamental pattern, however simple it may be in its formation, can be successfully produced. We are speaking of ruled paper drafting, and, in this, proficiency in drawing is quite as important as in inventing a design upon plain paper. For without it, how can one draft upon ruled paper from a given sketch—line for line, curve for curve, or flower for flower? Such a thing may be attempted, and, indeed, is done daily, but the result is not good; lines will be shaky, curves broken, and flowers deficient in formation. As the draughtsman gains experience, his eye becomes keener, and his senses more alive to the beauties or defects in design, and thus his efforts are always directed to the production of the most perfect effects; flowers, scrolls and all varieties of ornamentation coming from his brush with a perfect formation, unknown to the man, who may be well up in everything connected with his particular branch of work, except that often overlooked necessity, good drawing.

### The Indian Village in London.

At the Indian village, in Portland Place, London, some rather interesting work is going on in textiles. There are three embroiderers; one devotes himself to the working of patterns on various fabrics with the green beetles' wings so familiar to us in Indian decoration. There is nothing very special in the process. The design is actually worked out in the long pointed wings, which are placed and thus sewn down; they are then outlined, and the connecting lines put in with gold thread; or passing, laid down and stitched in the ordinary way. This style of embroidery was, a short time ago, greatly in favour in America—large decorations for curtains being carried out in beetles' wings, with very little silk or gold introduced. It owes any charms it possesses to the colouring—the harmonies between the metallic lustre of the greens, with a shimmering of reds and blues in certain lights on the wings, and the gold of the outlines and other ornamentation, always being pleasing. The silk embroiderer is apparently engaged in evolving a design from his inner consciousness by means of a most primitive hook stuck in a cork. It is the more interesting to see this kind of work in execution, because, judging from the antiquity of much of that chain work that comes before us, it is one of the oldest forms of decorative needlework, but it has been difficult to ascertain distinctly how it was done. It is known as "tambour" work, so called from the small round frames with double rims, resembling the head of a drum, which in the last century were used for it. Its name would seem to indicate that it reached us through France, and the most beautiful specimens in existence of European chain work are French, of the time of Louis XVI. In the early part of this century, tambour work was done on net, and gave rise to the Limerick lace trade, and, later, crochet was invented, being at first simply tambour done without any ground. In very ancient pieces of Turkish and Indian work the chain is so fine that it is almost impossible to see what stitch has been used, especially as the chains are run backwards and forwards and placed very close together. There is, however, apparently, nothing very difficult in the work of this silk embroiderer: he does not even use a frame—which we have hitherto considered a necessity in England—but pulls the silk up from the back of the fabrics on which he is embroidering, with his rude-looking hook, with great dexterity and quickness. The misfortune of this kind of embroidery is that machine chain-stitch is in all respects the same as tambour, and the production of cheap French machine work has discredited that done by hand. In one of the shops of the Indian village is exhibited a process of making a fancy silk, which puzzled many people when first seen in a Japanese crape robe, which was exhibited at Messrs. Liberty's show of Eastern embroideries both last year and this. In this case, the ground is a thin silk, on which the design has been roughly marked out with chalk, or something which rubs off easily. The workman very cleverly pushes up in his fingers tiny scraps of the silk, and ties them round, one by one, into a knot with a thin thread of silk, which has been previously waxed. When the whole pattern is thus tied out, the silk is dyed, and, when dry, the knots are untied. The waxed thread has prevented the colour taking in the knotted pieces of the material, so that it presents a design of small fantastically shaded stars or rose-shaped figures in lighter tones than the grounds. The silver and gold embroiderer works much as we do, in a heavy frame of rough construction, in satin-stitch. The silks used are much the same as the Japanese silks; but they do not appear to be twisted in the same way, so that they are more like floss. An interesting description is given by Mr. B. A. Gupte, in the Journal of Indian Arts, of the process of sorting and

reeling the silk; and it may here be watched as carried on by F. and J. Reblo, Indo-Portuguese inhabitants of Thana. The silk is first moistened, a skein at a time, and is thrown round a rough circular bambo cage called a "pitara." In the centre of the cage is a rod about 2½ feet long. About three inches from each end of this rod—that is, about two feet apart—are fastened about six spoke-like pieces of bambo, about a foot and a half long. The ends of the two sets of spokes are tied together with cords, and the skein of silk is thrown over the cords. In reeling and sorting, the worker, who is generally a woman or a girl, sits by the side of the cage on a stool, slightly to the left of it. She sets the bottom of the central rod in a porcelain cup, picks out the end of the hank of silk, and fastens it on to a reel, having a point at one end and a long handle. This reel she balances between the great toe and the second toe of her left foot, leaning the handle against her stool. She then sets the cage spinning round by whirling the top of its central rod with her left hand, and, as the silk is set free, she winds it on to the reel by giving the handle a quick rolling motion with her left hand, and letting the point rotate between her toes. A band of cloth is tied just above the knee of the worker, and the silk, in reeling, passes over this band. The sorter is supposed to be able to tell, by feeling the silk as it passes over the knee, when the quality changes, and, as there are generally two or three qualities of silk in each hank, she breaks the fibre the moment she perceives the difference in the quality and begins to wind on a separate reel, which she continues until the quality once more changes. After the silk is thus sorted, it is doubled, by winding fibres from two reels, by means of a small wheel or "roda," on to a bobbin made of hollow reed. The throwing machine is almost equally primitive, but it can be best understood by watching it at work. Block printing on cotton, silk and woollen fabrics, is to be seen here also. It is not essentially different from block printing as used in England, but it is more primitive in character, and the designs are very characteristic. The Indian workmen of the village are all craftsmen of the ancient style, following out literally the traditions handed down to them from remote ages, and are the more interesting as the introduction of European machinery and tools is likely in time to do away with the old handicrafts, replacing them with what may render the work more perfect in some senses, though it will scarcely be more artistic.—*The Queen.*

### Spindle Banding.



GOOD management recognises the importance of many small matters neglected by those who superintend the affairs of indifferently and badly managed concerns. No section of the store's department of a spinning or doubling concern is, as a rule, so badly served, or so little looked after by the managing officials, as that which is represented by spindle and rim banding. With a little consideration, it will be evident that the necessity of obtaining a superior quality of these articles is of no small importance, if quantity and quality of production are sought. The use of bad spindle banding always results in an increased production of soft cops, which have to be sold at a greatly diminished price compared with the bulk of the yarn—not only this, however, but in the production of an even larger number of cops which, although not actually soft, are formed of yarn, with somewhat less twist in it than should be the case. Such cops are not easily discriminated, but always make their presence felt, and materially reduce the value of the whole production. In some special trades, where the value of the yarn produced is relatively high, and the value of spoiled work relatively low, the importance of purchasing the very best spindle banding procurable has been recognised, and fancy prices have been, and are, often paid. Apart from the quality of yarn produced, the question of quantity has also to be considered. In mule spinning, when a band has to be renewed during working hours, the machine must be stopped, so that it can be slipped round the tin roller—consequently, the renewal of one band entails a stoppage of from 1,000 to 1,200 spindles; on doublers and throstles, this is not the case, but on these machines, the one spindle, which is actuated by the defective band, is probably stopped a much longer period. It is surely unnecessary for us to point out that, when one spindle, or all the spindles are stopped, a reduction in the utmost production attainable occurs. In the use of bad rim banding, a lessened production, rather than an inferior quality of the yarn, is the result. Many authorities hold that, apart from the question of lessened quantity and value of yarn produced, the use of inferior spindle and rim banding at a low price is by no means an economy, as the extra quantity used more than makes up for the difference in price. Most of the banding supplied by the makers is manufactured from soft and damaged cops. Some spinners, in order to get a somewhat superior article, have their own spinnings made into banding. This is somewhat of an advance, but they overlook one point:—viz., that it is not every quality of perfect yarn that is suitable to make a high class band. When spindle and rim banding are made from soft cops, whether weft cops or twist cops, it is simply absurd to expect that the banding will possess the qualities which the spinner requires. As well expect to be able to make "a silk purse out of a sow's ear." Some manufacturers of banding make their productions out of a low class of yarn, spun from such fibres as are contained in fly and stripes,



with a small quantity of cotton to bind them together. In this case, the band contains a large quantity of neps, motes, and dirt, which, of course, in no way add to its strength, and, which necessarily make the banding lumpy. Further, such yarns are, by their composition, sure to be irregular—full of crachers—and, therefore, wanting in lasting properties. Good banding can only be made from regular, high class yarns. Every end in the strand must be of equal strength, or as nearly equal in strength as may be attained. Every strand should be equally twisted and equally "ratched" or stretched. How is it possible, then, to make good banding from soft cops, which contain, almost invariably, cops of different counts and, therefore, of different strength and stretch? Moreover, soft cops always contain a large quantity of snarls. Every snarl is bound to affect the life of a band, more or less. In producing banding, the twist and ratch should always be adapted to the yarn from which the banding is to be made. How is it possible to do this, when the maker buys either soft cops, or job lots of yarn, about which he knows neither the composition nor the treatment in spinning? He may think that, by purchasing only from certain spinners, he may be able to ensure obtaining the same quality of yarn, but is this so? Do spinners, when they change their quality of cotton, inform the man who buys his soft cops? We fancy not. Nor do we think that the banding maker is aware whether the spinner has two or three different qualities of mixings in his mill, or whether he treats all his production in one and the same manner. We mean, whether some of his mules are spinning with the ordinary twist, whilst some may, be spinning with considerably less twist. In these days, when cotton manufacturers make such a great variety of goods, and require their yarn to be spun in so many different ways, spinners are seldom to be found, who have not more or less to vary their usual method of producing yarn. We do not like to prophesy, but we believe that the days of the small makers of spindle and rim banding are numbered, and that they, like many of our older institutions, will become, so far as those articles of production are concerned, things of the past.

### Means for Extinguishing Fire.

From "The Journal of the Franklin Institute," by C. JOHN HEXAMER.

(Concluded from Page 10.)



**EXTINGUISHING POWDERS.**—Bucher's extinguishing powder partially rarefies the air by heating the atmosphere, and also withdraws air in enclosed spaces, producing sulphurous acid, which tends to smother the fire. According to Heeren, the value and extinguishing results of burning di-sulphide of carbon does not consist in the absorption of oxygen from the air; and the effects of burning Bucher's powder are not produced by the resulting gases

replacing the air; but, he believes that the gases which are thus caused, consisting largely of sulphurous and carbonic acid gas, having a higher specific gravity than air, prevent all draught or circulation around burning substances, and that, therefore, air cannot reach them and supply the oxygen necessary for combustion. Liquefied sulphurous acid is one of the best agents for extinguishing fire. Bucher's powder, as prepared by Wittstein, contains 60 parts of saltpetre, 36 parts of sulphur, and 4 parts of charcoal. Schweizer prepares the powder with the following composition:—Saltpetre, 58.53 parts; sulphur, 36.33 parts; charcoal, 3.14 parts; sand, 75 parts; and oxide of iron, 1.25 parts. Heeren prepares Bucher's powder in the following manner:—Saltpetre, 63.73 parts; sulphur, 28.93 parts; charcoal, 3.80 parts; and oxide of iron, 3.54 parts. The ingredients are not powdered quite as finely as for the manufacture of gunpowder. They are then mixed and placed in small packages of pasteboard, so tightly packed that only a very sharp instrument can separate the particles. The composition can readily be ignited and burns (without exploding) with a strong white flame and penetrating odour and smoke. Out of every pound, 4.42 cubic feet of gas are produced, consisting of 2.36 cubic feet of sulphurous acid, 1.10 cubic feet of carbonic acid, and 1.36 cubic feet of nitrogen. According to Bucher, about one pound of the material should be used for every 240 cubic feet of space. In case of fire, the powder is thrown into the fire, whereby the results above described will be produced. These powders are only of value in small enclosed rooms, without many ventilating openings, and have practically proved valueless in places exposed to great draughts. One great objection to them is that they are extremely dangerous to life, as several cases of severe accidents have occurred in Europe. They have been of great value in drying-rooms, where substances coated or impregnated with petroleum compounds are dried. Dorn reports, for instance, a case in which a severe fire in the drying-room of an oil cloth factory was extinguished by it. The extinguishing composition of Zeisler consists of 60 parts saltpetre, 36 parts sulphur, and 4 parts charcoal and lime. The mass, after being mixed, is compressed into cartridges by means of a hydraulic press, and several of them are connected by a hermetically enclosed, easily ignitable, fuse. Grunberg's composition consists of 20 parts potassium chloride, 50 parts potassium saltpetre, 50 parts sulphur, 10 parts resin, and 1 part

magnesium di-oxide, tightly packed in the form of cartridges. Johnstone's powder consists of equal parts of potassium chloride, resin, potassium saltpetre, and black oxide of manganese, moistened with water-glass, and then pressed into briquettes, a number of which are shipped in one box, being connected by a fuse which can readily be ignited, and thus ignite the mass, the box being suspended near the ceiling.

**OTHER MEANS.**—Other means for extinguishing fire, which have been used, are di-sulphide of carbon, liquefied sulphurous acid, the gaseous products from under the boiler, water-glass, salt, magnesium chloride, sulphate of aluminium, ammonia gas, borax, sodium phosphate, Glauber salts, soda, etc. Burning fats, resins, pitch, etc., can be successfully extinguished by placing wire gauze of very fine mesh over the burning mass. The reason for this, which explains also the efficiency of the Davy safety lamp, is that flames are not transmitted through wire gauze, as the wire, being a good conductor, conducts away the heat, preventing the flames from passing through it. Sand is a very good agent for extinguishing fires originating in pitch, tar, petroleum and its products; in this case, water will be of little value, while sand, when piled upon burning substances, cuts off the supply of oxygen from the air, causing the flames to be extinguished.

**FIRE BRIGADES.**—Fire brigades were in use among the ancients. Thus we find under Augustus Cæsar, A. U. C. 782, that the Romans had a fire brigade of 600 freedmen. Organized fire brigades, in factories, should be drilled at least once a week. Every man should have his special duty assigned him and know exactly what to do in case of fire; only these men should be allowed to take part in extinguishing fires; strict rules should be promulgated that every one not belonging to the fire brigade must remove from the premises as soon as the fire alarm is given, thus giving the firemen room to work. The brigade should be drilled at a different hour weekly, for if they be always drilled at the same time, they will be prepared for the event; will go through their drill at this time in good manner, but, when a fire starts at another time, they may be excited, and slow to get to work. For this reason, it is necessary that the chief of the brigade should give the fire signal at different times every week, and thus get the department on duty at times when they do not expect it. He will, thereby, accustom his people to get to work rapidly at all times, and as they do not, at the time when the alarm is first struck, know if it is merely an alarm or an actual fire, in the course of time, they will get over the excitement which is generally incidental to such an occurrence. It is absolutely necessary that the chief shall insist on all occasions that his men get to work immediately. If he allows slovenly practice, he will have the same state of affairs in case of fire.

**FIRE ALARMS.**—The first fire alarms used were either large bells, gongs, or whistles which, by their peculiar sound, would make known that a fire had originated. The ordinary steam whistle is an excellent arrangement. This consists of a hollow hemisphere against which the steam is blown from a valve, the metal is set in vibration, imparts this motion to the contained and surrounding atmosphere, setting this also in vibration, thus producing a sound. Where steam whistles are used as fire alarms, it is necessary that these should be very loud and have a shrill peculiar sound, different from all others in the neighbourhood, so that persons may at once recognize them. Automatic fire alarms have been introduced for some time. One of the oldest is that of Joseph Smith, first introduced in 1802, which was set in operation by means of a cord, which being burnt through, released a lever in connection with a steam whistle or a bell. Another apparatus used was a wire extending over a mercury receptacle, connected with a lever, which it held in place. When the temperature rose, the mercury contained in the receptacle touched the wire, amalgamated the same, which caused the tensile strain on the wire to part it, relieve the lever and cause an alarm. These devices were never of much practical value. Of late, the so-called thermostats have been introduced. These are of various construction; some consisting of strips of different metals, tightly fastened together, which, by their unequal expansion, bend, thereby forming contact with a metal strip, which closes an electric circuit, causing an alarm to be struck at the fire station. Another consists of a bulb containing mercury, into the bottom of which a wire is melted, and in the upper end a wire, which does not touch the mercury, is hermetically sealed. When the temperature increases, the mercury in the column rises and touches the upper wire, forms contact, closes the circuit, and gives the alarm at the station. Another very ingenious device is that of Fein of Stuttgart, which consists of an arrangement held in place by means of a spring, the spring in its turn being kept in position by a fusible cylinder. The temperature rises, destroys the fusible cylinder, the spring is released, and contact is made, an electric circuit formed giving the alarm.

At the Leipzig new year's cloth fair, stocks were not particularly strong, since it was not expected that the business would be very great, while manufactures have been restricted lately owing to the bad state of business. A large part of the goods offered found a good sale, though at poor prices. There were few foreign buyers, Holland being, however, represented by active purchasers. Cotton and half-cotton coat and trousers stuffs were shown in small quantities. Manufacturers, it may be added, are at present passably employed, though at unremunerative prices. The production is intended in great part for export, the German market consuming less every year.



### Receiving Orders.

Mathers, S., 3, Park Place, Leeds, cloth manufacturer.  
Ward, M. (trading as Richard Ward and Sons) Batley Carr, Yorkshire, woollen manufacturer.

### Adjudications of Bankruptcy.

Ellington, H. R., and Aldred, J. T. (trading as Ellington and Son), 13, Friday Street, London, warehousemen, manufacturers and importers.  
Heap, H. (trading as the Whitcroft Printing Company), Baxenden, Accrington, calico printer.

### Dividends.

Airey, G., and Airey, B. A. (trading as B. Airey and Co.), Victoria Mills, Brighouse, Yorkshire, silk merchants, rs., Offices of the Trustee, Town Hall Buildings, Halifax.  
Davies, J. M., Dyffryn Tawel Factory, Llanstephan, Carmarthenshire, woollen manufacturer and weaver, 2s. 11d., Official Receiver's Office, 11, Quay, Street, Carmarthen.  
Goold, J. C., 19, Union Passage, Birmingham, silk merchant, 7s. 2d. (first and final), Offices of the Trustee, Samuel Hunt, 21, Nicholas Street, Manchester, accountant.  
Patchett, A., Bradshaw Mill, near Halifax, Yorkshire, worsted manufacturer, 1d., Offices of the Trustee, Town Hall Buildings, Halifax.

### Dissolutions of Partnership.

Beaumetz, A., E. Monday, E. Kahn, and A. Carhian, 73, Great Eastern Street, Middlesex, merchants.  
Bradwell, D., and J. Bradwell, 2, New Street, Bishopsgate Street, London, silk merchants.  
Donaldson, A., and E. C. A. Rew, 18, Lawrence Lane, Cheapside, merchants and manufacturing agents.  
Dyson, S., J. Atherton, and W. Dyson, Kearsley Mills, Kearsley, Lancashire, cotton spinners.  
Huth, C. F., L. Huth, J. F. Flemmich, F. M. Huth, D. Meinertzhagen, J. S. Colmann, and E. Huth, Tokenhouse Yard, London, merchants.  
Hoyle, J., and R. Hoyle, Wheelton, near Chorley, Lancashire, cotton spinners and doublers.  
Philips, R. N., J. W. Philips, J. Chadwick, R. O. Milne, W. M. Philips, G. W. W. Blathwayt, A. Greg, and A. Payne, Dyer's Court, London, sewing cotton manufacturers, &c.; and at Eagley, Lancashire, bleachers and dyers.  
Wolfgang, E. G., and A. J. Giessen, 6, Wood Street Square, Wood Street, London, foreign merchants.  
Welsh, W., and J. Hyde, Horrock's Lane, Red Bank, Manchester, dyers, &c.  
White, H. H., and A. J. White, 10, Lever Street, Manchester, velvet and velveteen manufacturers.

### PATENTS.

#### Applications for Letters Patent.

Application of temples to looms. A. Shaw, Manchester. 25th Jan. 1,064  
Breaking, splitting and combing the stalks and leaves of plants yielding textile fibres. W. A. Barlow, London. 31st Dec. 16,101  
Bleaching quilts and other heavy or light fabrics and yarns by the Thompson or other analogous processes, which are applicable to dyeing. R. H. Ainsworth and E. B. Manby, London. 14th Dec. 597  
Coverings for rollers used in textile and other machinery. S. Bergstresser, Manchester. 5th Jan. 138  
Cans for yarns, &c. L. Bridge, Halifax. 7th Jan. 256  
Cut or uncut pile fabrics. Messrs. Lishman and Bootland, Silsden. 9th Jan. 363  
Cotton figured west pile fabrics, as velvets, &c. J. Edelston, Manchester. 11th Jan. 415  
Calico printing machines. W. Stewart, Glasgow. 14th Jan. 617  
Combing feed mechanism for cards and similar wool working machines. Comte V. de Nydrück, London. 18th Jan. 780  
Cutting pile fabrics. J. J. Mann, Salford. 21st Jan. 922  
Cleaning the rollers and other parts of machinery in motion when spinning wet fibre. H. M. Gordwood, Manchester. 22nd Jan. 971  
Carpets, rugs, mats, &c. W. and W. C. Green, and J. Nicholls, London. 25th Jan. 1,121  
Curled or looped fabrics. H. Lister, Halifax. 27th Jan. 1,204  
Carding machines. W. Cunningham, Glasgow. 28th Jan. 1,256  
Driving belts. S. Turner, Manchester. 31st Dec. 16,059

Driving belts, bands, straps, &c., and appliances connected therewith. Messrs. Firth, Sheffield. 20th Jan. 873  
Driving spindles, employed in spinning, twisting, &c. M. Astle, London. 20th Jan. 884  
Fastening the ends of driving belts or bands. T. H. Smethurst, Manchester. 2nd Jan. 49  
Flyers for spinning machines. C. Mauris, London. 5th Jan. 202  
Friction plates of yarn sizing machines. P. Brimelow, Halifax. 7th Jan. 257  
Fixing on shafts divided pulleys, wheels or bosses. R. Maehar, London. 18th Jan. 781  
Gassing yarns or threads. T. Rivett, Manchester. 18th Jan. 766  
Heating and drying fibrous and textile materials. Messrs. Cochran, Glasgow. 5th Jan. 181  
Improvement of the picking strap by doubling from stick to picker (double picking strap). J. Wilkinson, Bradford. 22nd Jan. 983  
Loom Pickers. Messrs. Shorrock, Chorley. 5th Jan. 132  
Looms. G. Kirk, London. 8th Jan. 334  
Looms or apparatus for making fabrics in edgings with twisted fringes. Messrs. Muller and Spieser, London. 14th Jan. 618  
Looms for velvet or cut pile fabrics. W. H. Bairstow, London. 14th Jan. 619  
Looms for looped, or velvet, or cut pile fabrics, or combinations thereof. W. H. Bairstow, London. 14th Jan. 620  
Method and apparatus for transporting raw cotton, and drying it by a current of hot air, called a "hot air blower." E. Lamy, London. 31st Dec. 16,091  
Measuring and ascertaining the measurement of rolled piece goods. F. Thorman and C. Bender, London. 22nd Jan. 988  
Production of piece dyed goods. J. C. Munn, Manchester. 6th Jan. 211  
Preparing cotton. B. A. Dobson and W. J. Bromley, Manchester. 20th Jan. 874  
Preparing flax, &c. J. C. Mewburn, London. 28th Jan. 1,278  
Ring spinning frames, part of which improvement is applicable to flyer frames. J. Lilce, Manchester. 7th Jan. 258  
Ring spinning. R. Chalmers, Glasgow. 19th Jan. 848  
Spinning and twisting flax, &c., and regulating the speed of bobbins. A. Dobson, Belfast. 31st Dec. 16,049  
Spinning, doubling, and winding yarns of cotton, &c. G. Kirkman, Halifax. 8th Jan. 306  
Scouring, washing, chroming, and dyeing woven or felted fibre in an open state. T. W. Hudson and F. W. Schröder, Leeds. 9th Jan. 359  
Squeezing or wringing woven or felted fabrics in an open state. T. W. Hudson and F. W. Schröder. 9th Jan. 360  
Silk-like yarns, threads, tissues and felted fabrics from vegetable fibres. W. Fairweather, Glasgow. 11th Jan. 433  
Shuttles. D. Morrison, Glasgow. 20th Jan. 864  
Size for textile fabrics, yarns and threads. J. L. Wade, Glasgow. 21st Jan. 938  
Spinning frames. J. H. Fitzgerald, Glasgow. 21st Jan. 940  
Screw gill boxes for preparing wool, silk, &c. G. W. Douglas and J. Shaw, Bradford. 22nd Jan. 982  
Supporting and lubricating the spindles used in machinery for spinning and doubling cotton, &c. J. Dodd, Manchester. 22nd Jan. 1,005  
Seal skin and other pile fabrics, and method of producing patterns on the same. H. Lister, Halifax. 27th Jan. 1,205  
Treatment of the pile of silk plush, velvet, &c., and apparatus therefor. Sir Titus Salt, Bart. Sons and Co., Saltaire. 1st Jan. 18  
Treatment of oils for use in treatment of wool in the manufacture of soap and lubricants as mordants for dyeing, &c. J. Y. Johnson, London. 11th Jan. 449  
Twist-lace net. J. Drummond, London. 11th Jan. 431  
Twins for yarn doubling. W. Bottomley, Manchester. 12th Jan. 458  
Treatment of animal fibres or mixed fabrics to remove vegetable matter therefrom. O. Chemin, London. 13th Jan. 564  
Tentering and drying machines. J. T. and E. Kershaw, Rochdale. 14th Jan. 580  
Testing card flats. E. Tweedale, Halifax. 22nd Jan. 984  
Warp drying machines. E. Wilford, London. 2nd Jan. 80  
Wool combing machines. W. Terry, Halifax. 7th Jan. 264  
Yarn winding. W. E. Heys, Manchester. 30th Dec. 16,008

#### Patents Sealed.

15,958	6,295	6,296	8,083	9,238	10,724	15,866
15,881	6,471	8,220	9,136	11,100	16,271	16,837
17,083	5,777	6,509	11,660	16,956	17,109	383
11,794	10,518	16,395	3	34	55	429
1,325	1,407	11,878	16,287	16,543	1,351	3,041
4,722	12,044	12,061	15,814	16,272	16,999	179
196	483	732	837	961	1,005	1,058
7,672	8,464	10,502	11,889	1,073	1,107	1,227
1,497	1,571	2,407	7,886	8,930	10,495	12,389
193	346	674	1,255	1,370	7,129	



# The Journal of Fabrics

AND

## Textile Industries.

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## The Shipping Trade in Textile Fabrics.

### Goods Adapted for Different Markets.

(By our Special Trade Commissioner).



OF late years, a very notable change has come over our markets for textile fabrics, of what may be termed the higher class of production, that is to say, of fabrics taken in the colonies, and in our numerous dependencies, by people of European extraction. Grey and bleached calicoes, and various cheap fabrics, may still be wanted by various aborigines, and by the millions of inhabitants in those teeming

Eastern countries, whose normal condition remains pretty well unchanged, as the Chinese and the Hindoos; but in those settlements where the material condition of the masses has made a great advance, the demand, at present, is for a much higher class of goods than formerly existed, which, though only a natural condition of affairs, and what might be expected, is, unfortunately, too often lost sight of, for in such markets as those of Canada

and Australia, more expensive goods are actually needed, upon the whole, than in the home trade, taken collectively and in bulk. Formerly, when anything was a little out of the way—of an odd or “bizarre” description—it was commonly said:—“Oh! it will do for shipping,” a corresponding reduction being made in price, in accordance with its presumably unsaleable character; but those were the times when a reduction of a shilling or two a piece would make a “job” of anything, and for which there were always plenty of buyers, anxious to secure a line below current values. But now it is not cheapness that is first looked for, but appropriateness and fitness; and goods must be in accordance with the latest mode, to go down in such markets as those of our Australasian dependencies. There, the latest modes are always needed, and, perhaps, even the exaggerations of fashion are more positively insisted upon by consumers than the severer taste of the better class of Englishwomen would allow them to adopt; the latter being more disposed to modify eccentricities than to magnify them, and having a horror of anything *loud*; though, it is by no means asserted that vulgarity in this line is insisted upon, but rather the opposite, a certain amount of good taste being quite essential; but things must be in accordance with the latest, and ruling fashion. Although it is well, and even absolutely necessary, to keep these leading facts in mind, yet, at the same time, no positive line can be drawn; for goods in even what might be deemed bad taste, and be laughingly rejected for either the home, Australasian, or Canadian markets, are appreciated in certain localities, and it is here that the distinction needs to be drawn, and certain peculiarities pointed out, to which no set rules will apply; but the circumstance requires to be noted, that fabrics, which are quite unsuited to one, will be well adapted for another market; what is wanted is, that the manufacturer knows the one he is aiming at, and, therefore, it becomes necessary to address those shippers who send special goods to the particular market that is suitable for any given lot. Some time back, I was shown a lot of 50 inch printed meltons that were in the hands of a London agent, which, both to the agent in question and myself, appeared of a most extraordinary character. They were printed in somewhat broad shaded stripes, not in distinct lines of colours, after the manner of those known as “Roman stripes,” and which have been saleable in some years in the form of ribbons, woollen sash goods of close texture (the same as made in the Glasgow and Paisley districts), but the tones of colour melted, so to speak, gradually one into the other, more like the rays of light when dissected by a prism; or plainer still, like the colours of the rainbow; a deep mauve prevailing in the middle of each stripe, the ground being of a greyish tone. What to do with the goods, the agent did not know, and they were simply laughed at by the common run of London buyers, who supposed the intention was to cater for some kind of mantle cloth. Unsuitable, however, as they were, patterns having been sent out perseveringly in every direction, they were at last taken up by a house in the Italian trade, at full prices, and not only every yard sold, but repetition orders given for the same goods, at a time when it began to be despaired of that they could ever be sold at all. For the same market, the old fashioned, men's square mufflers in chintz colours still continue to sell, while they are quite out of date, to any extent, as an article of sale in this country; and the cause must be taken into consideration, that the inhabitants of a “sunny clime” are somewhat given to gay and brilliant effects, the same classes of goods selling, to a certain extent, amongst Spaniards of an inferior social grade, whose costumes are of a somewhat “picturesque” description. In the same way, when the Nottingham imitation Shetland shawls first came out, made upon old lace-stocking frames that had stood idle for many a day, in consequence of lace hosiery having gone out of fashion, these shawls were made slack upon them, and stretched out on frames of the necessary eight-quarter size for a shawl, and were turned out in various gay colours, upon a white ground, as borders of scarlet, blue, amber, crimson, &c. They sold well enough in the home trade, being adapted for a certain use, that of an *occasional* shawl, to be resorted to upon chilly evenings at the sea-side in early autumn, or upon leaving a heated room, as that of the concert, theatre, &c., but they were never worn as a shawl proper, that is, spread out upon the back of the wearer, corner-wise, after the old, orthodox method of wearing a shawl, but were often gathered up in a bunch, for which their



light texture admirably adapted them, and were worn thus round the throat, or negligently thrown across the shoulders. They were, however, purchased in large quantities by American buyers, who dispatched them (as well as taking them up for the New York trade after the English fashion), to New Orleans, where they became at once greatly in favour with the negroes and creoles, who make up such a large part of that population, where they were consumed in considerable bulk, being used as a shawl, and highly appropriate thus for a warm climate. It is this more familiar acquaintance with the wants, or openings for goods, in the various markets, of which our manufacturers stand so greatly in need, and the time has arrived when shippers seek to put themselves more in direct communication with the producer than used to be the case in former years, when they were content to buy of the middle-man, or warehouseman, who had the command of the trade much more in his hands than he has at present; and manufacturers hence would do well to keep by them as many sets of samples as possible, for future, or ultimate reference, and to exhibit to buyers; for old, or historical styles, as they have been sometimes called, are often resuscitated, and become once more in demand. No more striking example could be adduced of this, than the instance of the small-patterned Pompadour chintz prints, which were the means, a few years back, of producing quite a revival in the print trade, that had previously been in a declining position. Hoyle's and Ashtons' lilacs, and similar well-known makes, were in demand at the beginning of each year, as a matter of course, and were in use by servants, and a certain section of the working population; but prints, as an article of common consumption, had been thrust aside by the many cheap, and attractive fabrics that are regularly turned out now in fancy dress goods. But the Pompadour chintz prints upon black, dark chocolate, and buff grounds, were taken up, not only to be used after the ordinary manner to which prints are applied, but were largely made use of as accessories, or trimmings, to dresses of other materials, in the form of pinafores, sashes, and other applications; and, frequently, thus served to put a new face upon old dresses that would otherwise have been cast aside. The maker-up of cheap costumes, which is now a large branch of trade, largely availed himself of their assistance, while a new department to the warehouseman also sprung up through their agency, which has resulted in great piles of ready made pinafores and aprons being regularly sold, and the largeness of the lots of some of these goods, that are now got through, would astonish those who are unacquainted with the trade, and which employs great numbers of hands in London, as well as in many large producing towns, such as Glasgow, and even Belfast; in the latter, an enormous trade in ready-made goods is growing up, besides such as those of collars, cuffs, handkerchiefs and other wares of an analogous nature to the Irish linen trade; and to such provincial markets shippers are beginning largely to resort. While speaking of old styles and their possibly successful resuscitation, having incidentally mentioned the article of mufflers, I may, perhaps, appropriately express my belief that what used to be known as the old "Stockport handkerchief," would, in all likelihood, sell again. Those who are unacquainted with this article need to be informed that it consisted of a white cotton ground, upon which were placed woven coloured cotton figures, of a small size, mostly in the form of a spot, not larger than a pea or a bean. These were in favour as a kind of stock article for generations, and when they were discarded by fashionable, or would be fashionable people, they lingered on for many years, being held in great favour by such persons as hackney coachmen, cabmen, ostlers, stable-helpers, costermongers, and others, simply on account of their cheapness. They came out at a low price, and as they could be made new, as it were, by washing, were a most serviceable article, and, when fresh, a clean looking thing. Now that white is a good deal affected by muffler wearers, something produced in this line would, in all probability, turn out to be successful, and once begun, there is no telling into what shape a class of article of this kind may finally resolve itself; for fresh departures are thus sometimes struck out that prove to be of considerable advantage to those who make such experiments. Such a fabric, for example, properly made, would not be inappropriate as a mantle cloth, in shapes not of too large a size; and at the time that Stockport handkerchiefs sold of yore, mantles were not in existence of the kind that are now commonly seen. Probably, too, something of this sort might sell as a dress material.

### A New Opening in Morocco for Manufacturers.

Sir John Drummond, who has for 40 years been the English Representative at Tangier, will, it is hoped, by the aid of the Spanish Ambassador, terminate his successful career in Morocco by inducing the Government of that country to accept a more liberal commercial policy than they have hitherto been willing to allow—the result of which negotiations will be to open up new markets for manufactured goods. In these days of over production, keen competition and general depression, the prospect of extensive and populous countries being thrown open to our surplus produce must be welcomed by master and workman alike. Morocco is two or three days' journey from Marseilles, and five from London. It is a large country, and requires only European civilisation to produce immense wealth, England has sought to remove, says the *Warehouseman*, all existing impediments to trade, but in this, she has met the stoutest resistance from the Moors. Nor is such obstruction unreasonable, if we take their side of the question. Actually, every article of native produce is excessively cheap, labour included, and the Moors have not as yet developed much taste for foreign goods. If the country be thrown open to European commerce, labour, land, and the necessities of life, will be dearer, for there will be more purchasers. Lands will be cultivated, the mineral wealth of the country disinterred, factories built, and roads made. But all this life and enterprise will be initiated by the Europeans; they will become the rich and powerful inhabitants of the country, and the leading Moorish families will soon lose their present preponderating influence. The natives feel that they are not capable of coping with Europeans, and they, therefore, seek to keep back the tide of progress, knowing they are more likely to drown than to swim, when once it bursts upon them. To break down this somewhat interested, but natural, prejudice has been the work of years. The Morocco Government have exercised consummate ingenuity in the art of prevarication and postponement. But now it seems as if, at last, commercial treaties would be accepted, the prohibitive export and import duties abolished, and foreigners will be allowed to buy and cultivate land. This will be fruitful in good results, not merely so far as trade generally is concerned, but our own special branch of commerce will find fields and pastures new. For instance, morocco leather, made anywhere and everywhere, save in Morocco, already holds a high position in the world's market. There will be a better prospect of obtaining the genuine article. In the dyeing of silk and in silk embroidery, the Moors are consummate artists; some products of this description will not fail to attract the admiration of the æsthetic school. Cotton fabrics are utterly unknown in Morocco, so far as the native industries are concerned; but "pure wool and all-wool" is now the cry of many sanitarians in dress, and every tissue made by the Moors is made of nothing but wool. These cloths, plain and coloured, are made in a very primitive manner, by hand-loom. There is not such a thing as a steam engine throughout the vast domains of his Sheriff Highness, the Sultan of Morocco. But the hand-made cloth has the advantage of wearing extremely well, and for the present, at least, is very cheap. Then there are the ornamental and highly artistic brass trays, rich with arabesque designs, engraved by hand. Unlike other artistic objects, such articles cannot be damaged by use; nor, being made of one solid piece of brass, can they be worn out. These are but a few out of many goods which we might import from Morocco. On the other hand, the country would receive from us almost every article of English manufacture. It is simply a question of opening out the country, and developing its resources. We, therefore, sincerely trust that the good promises held out to us will be fulfilled, and that Sir John Drummond Hay, in leaving Morocco to enjoy his well-merited repose, will be able to bring away with him a broad and liberal treaty of commerce.

A patent has been obtained by Messrs. John Sutcliffe and Son, of Halifax, makers of all kinds of wood working machines, amongst which may be named the machine for planing out of twist and thickness combined. The patent in question is numbered 3164, and is described as a Diagonal Cutter, to work in any vertical spindle machine, and is for cutting any kind of cross grained, hard or soft wood out of twist, for glue joints and chamfer, &c.

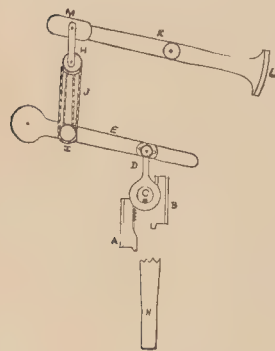


### New Box Motion for Power Looms.



**L**N these times of keen competition, when manufacturer is striving against manufacturer, and nation against nation, and profits are, consequently, reduced to the lowest minimum, any improvement in the machinery employed in textile production calculated to relieve the weaver, or to cause the loom to work better, and thus afford increased facilities of manufacture, will, no doubt, be highly appreciated, and favourably considered. Messrs. Pearson, Spurr and Co., Limited, machine makers, Birstall, near Leeds, have, for some time past, been experimenting, with a view of adding to their looms an entirely new box motion, a description of which, we thought, would probably prove interesting and useful, to our practical readers. It is admitted that the shuttle box arrangement, in every class of power loom, is one of the most important motions, arising from the fact that the formation of the pattern, in many cases, depends upon the order of the picking, or the arrangement of the colours in the weft. Now, as the employment of two, three, four, or six, colours of weft implies the use of a corresponding number of shuttles, the complicated patterns of weft called for in both fancy woollen and worsted goods, in recent years, have necessitated additional improvements in the capacity of the box motion, and hence a large number of looms, instead of being made with two boxes at either end of going part, as formerly, are now made with twice the number. The new box motion, invented by Mr. Bedford, foreman over the works of Messrs. Pearson, Spurr and Co., may be made with two, three, or four, boxes. In large or top swing looms, the boxes may be actuated in two ways:—by the engine or dobbie,

Fig. 1.



or by a chain, composed of various kinds of links, revolving over a barrel fixed behind the loom. The former is the principle of conveying movement to the boxes adopted by Mr. Bedford in his invention. For this purpose, he employs two principal levers, one for each series of boxes; these, in a four-box loom, carry two smaller or swing levers, which are so arranged as to operate indirectly, or through the agency of the principal levers on the boxes. Thus, if a peg were to strike the outside swing lever, it would give  $\frac{1}{2}$  of a complete movement to the principal lever, and consequently to the part N to which it is connected by rods, elevating the second box; the centre swing lever would impart  $\frac{2}{3}$  of a full movement to the principal lever, and raise the third box; while, if a peg came in contact with the principal lever proper, the fourth, or bottom, box would be lifted. From this, it will be concluded that a peg elevates a box, so that, having three lifts at each end of the batten, when four boxes are employed, the lag contains seven holes,—six for the shuttle boxes, and one for the pick-jack. This is a method of controlling the elevation and the depression of the boxes, which will bear recommending, because little or no complication needs arise in pegging the lags, or in changing the plan of picking. But this is not the newest feature about the motion before us; the inventor has sought to minimise the wear and tear occasioned by the unsteady rise and fall, especially the latter, in heavy drop box looms. Of course, the object of employing what is termed the balance weight is to accelerate the rising of the boxes, and also to steady their downward movement; but, nevertheless, there is not that smooth, regular drop which is desirable. This will be evident from a consideration of one or two points in connection with the ordinary drop box mechanism. The boxes, in this class of motion, are raised by a series of levers, but their own weight is generally regarded as sufficient to cause them to make a speedy

drop. It will be clear that, when a balance or checking weight is used, the movement of the boxes, at the commencement, cannot be so rapid as at the termination of the fall; the boxes will, necessarily, in such a case, move comparatively slowly at first, but gain speed as they proceed downwards, concluding the drop with considerable vibration. The same principle holds good when a balance weight is not employed, only the vibration caused is possibly more lasting, and even more injurious to the loom, because, in such machines, when the stay or support, which maintains the boxes in an elevated position, is withdrawn, as there is no regulating or balancing power to control the



Fig. 2.

drop, the boxes fall with their full swing on to the low framework of the going part. The speciality of Mr. Bedford's motion, and one of the principal advantages it possesses over other motions, is that of steadiness. This is the feature he has particularly endeavoured to attain, and that he has satisfactorily succeeded may be ascertained by a study of the principle of his motion. The speed of the boxes, whether travelling up or down, is exactly uniform, and the movement is perfectly smooth and steady. The novelty of the mechanism, apart from its technical merits, is sufficient to demand careful attention. Fig. 1 shows the arrangement of the various parts in the motion. The lever K, at point L, is in communication with the boxes, while at M, it is connected to the balance weight levers by means of the chain J, and pulleys H and I. Fig. 2 is a plan of these levers, showing the manner in which the pulleys are arranged in a kind of block, which swings on lever K, although there is a separate balance weight lever E, for each lift, yet there is only one lever (K, Fig. 1) in direct communication with the boxes. The pulleys of the block are set at an angle with those of the levers, to allow the same chain to connect them to the lifting lever. If the outside balance lever is lifted, it raises the second box; but, in combination with the centre lever, it raises the third box; while the three levers together elevate the fourth box. The connecting chain I can never run slack, because, when any particular lever is lifted, the weight of the boxes maintains it at one even tension. Again, lever E (Fig. 1) is connected to the strap D, which carries a cam or eccentric C, mounted with a pinion or small cog wheel, working between the two racks A and B. Each box requires one pair of racks, one strap lever, and one balance lever. The racks are the parts which are primarily operated upon, and which convey motion through levers E and K to the boxes. Now the steady ascent and descent of the boxes are due to the rack and eccentric system of actuation, for they can only rise and fall with these parts, and, hence, the drop is as smooth and steady as the rise. The part N has a two-fold motion, receiving a lateral movement from the box levers, and an upward and downward movement from a cam on the crank shaft. The function of this lever is to engage the respective racks, according to the extent of the motion which it receives from the box levers of the jacquard. Another notable contrivance in the loom, we examined, was the manner in which the boxes were fixed on to the lifting lever. There are times when the shuttle, from various causes, does not box properly, and, in such a case, if the weaver should not promptly stop the loom, damages of a serious character might take place, more especially if one end of the shuttle should be jammed against the underneath side of the hand-rail, and the other end lifted by the boxes. Now Mr. Bedford has arranged the connection of the lifting lever with the boxes on such a principle that an occurrence of this character would not occasion the slightest damage to the loom. Providing, for example, the shuttle were locked, as just described, the boxes would be immediately disconnected from the elevating lever, allowing it to rise in harmony with the motion of the other parts of the loom, and, thus, preventing an unsatisfactory and dangerous trap. We may also add that the same inventor has on hand an improved fast running loom, which we have also carefully examined, and may at some future time describe for our readers, for we believe that it will prove to be a very useful and valuable loom to makers of both fancy woollen and worsted goods; it is to have four boxes at each end of the going part, to possess a weaving capacity of 24 shafts, and to be capable of being speeded up to 90 picks per minute.





### Improvements in Lighting by Gas.



LAST month, we endeavoured to place before our readers, a description of the best methods in vogue for supplying gas to the several rooms of a cotton mill. The distribution of the same in the rooms is, however, of as much, or even greater, importance, so far as economy is concerned. As our space is limited, we will describe the improvements now effected as tersely as possible. We have before shown that great saving may be made by the employment of suitable gas governors, for controlling the pressure of the gas in the main pipes, in each room. We feel sure that our readers will admit, that arrangements, by which the greatest possible amount of illumination is attained, from a minimum consumption of gas, will effect a further great saving in the amount of the annual gas bill. In considering this subject, the one point to be borne in mind is this—how may the illumination, given from each gas jet, be directed to that part of the building and to that machinery where it is needed, to the exclusion of such parts of the mills, and of such machinery, where it can be of no use or advantage? The old arrangement of gas lighting threw much of the light upon the ceilings of the room, where it could be of no possible utility; consequently, more gas jets were necessary to light up the machinery placed upon the floor of the room. Some parts of the machinery require more light than other portions; by the old system, to obtain this, the jets were often placed so close to the machinery as to very largely increase the risk of fire. As a case in point, we would refer to the system of lighting the spinning mules by gas jets, placed just over the roller beams. The new system obviates this to a large measure, for, by the use of reflectors, the light may be cast where required. When reflectors are properly applied, the light, hitherto wasted upon the ceilings of the room, may, to a large extent, be made available for the machinery. It is impossible to give any hard and fast rule as to how these reflectors should be set, because so much depends upon the different kinds of machinery that are to be illuminated; also upon the shape and size of the rooms, and upon other conditions. It is usual to have the holder of the reflectors made so that the latter may be more or less inclined, as may be found desirable. We purpose to describe some rooms which we have seen successfully, in some cases brilliantly, lit by gas lights, with reflectors attached. In mixing and blowing rooms, it is usual to have some kind of protection for the lights. These protections have been found necessary as precautions against fire. Glass lamps are used for this purpose, and we venture to think that few lamps can be found that are so calculated to waste light as those generally in vogue in blowing rooms. With heavy frame work, deficient arrangements for the admission of air, and little or no reflecting power to help the gas to shed its light abroad, they stand a monument of the spinner's lack of knowledge of the natural laws which govern this subject. We strongly recommend the adoption of lamps made with a tin back, with circular glass front, and sides made of *one piece of bent glass*. The lamp should be made large enough to hold a 14" or 16" reflector, and the lamp should be, at the top, at least four inches wider, from back to front, than at the bottom. The bottom of the lamp should be made of wire gauze fixed into a frame which has hinges attached to the back of the lamp, for the convenience of lighting the gas, and cleaning the glass. The wire gauze should be cleaned from dust and fibre at stated periods, according to requirements. It is absolutely impossible to get a satisfactory illumination from gas, if you deny it a sufficient supply of air. Arrangements should be made at the top of the lamp for the emission of the heated and used up air, and these arrangements should always be made of sufficient capacity. We have no hesitation in saying that such lamps will give more than double the amount of illumination derived from lamps of the old style, and this, without any increase in the consumption of gas. Spinners, who produce superior qualities

of yarn, will recognise the value of such lamps for use in mixing rooms especially. It is difficult at all times to judge cotton well by gas light, but, by poor gas light, it is quite impossible. In card rooms it is very common to use similar lamps in that portion of the room where the carding engines are placed. The new style of lamp will be found to be equally satisfactory here. Probably, no machine requires so few gas jets as intermediate and roving frames. The proximity of the creels, filled as they are with bobbins clothed with the white cotton, enables a few jets to do a great amount of work. One light, with a reflector, will be found amply sufficient for a pair of frames, each 32 feet long, giving equal results to three lights upon the old system. It is preferable to place the light with reflector at alternate ends of each pair of frames. For instance, at the driving ends of 1 and 2 frames, at the opposite ends of 3 and 4 frames; at the driving ends of 5 and 6, and so on. Longer frames will require two lights—these should be then fixed as follows:—over the frames with odd numbers, 1, 3, 5, &c., the light should be fixed at the driving end, and over the frames with the even numbers, 2, 4, 6, &c., at the opposite ends. Where one light only is required for two frames, the light is placed exactly over the centre of the passage between the frames, but, when the frames require two lights, it is preferable to place the light a foot or so nearer the frame it is supposed to light. It should always be remembered that a reflector properly fixed will illuminate from three to four feet behind, so that the lights should always be fixed at least that distance from the ends of the machines. Throstles, though not so easily lit as intermediate or roving frames, are yet much easier to illumine than spinning mules. Two reflectors will most satisfactorily light up two sides, each 60 feet long. In this case, the same system of alternation is observed. For the first side, the reflectors are placed near the centre of the side, being some six feet apart; for the next side, they are placed three feet from the ends of the side, and thus down the room. We have seen rooms used for throstle spinning, where two-thirds of the gas lights have been displayed by the application of reflectors to the remaining third, and where the resulting illumination was considerably superior. Mule spinning rooms are probably the most difficult to light satisfactorily, and economically, of any room in a cotton mill, with the exception of a jacquard weaving shed. The distance of one row of creels from the row upon the fellow mule (nearly twenty feet), makes it impossible for much assistance to be given by the lights over one mule to the mule next to it. Further, if the lights are placed at an equal distance between the two mules, then the operative, when following his occupation, stands in his own light. When the gas lights are placed over the roller beam of each mule, this, of course, does not occur, but, as the risk from fire is so largely increased, this plan is not by any means desirable. When reflectors are used, the jets are placed about two feet from the roller beam. Six reflectors are sometimes found sufficient for a pair of long modern mules—three for each mule—one being placed so as to give a good light to the headstock. This is a point which must never be lost sight of, as it is absolutely necessary that the headstocks should be well lit up. By placing one reflector three feet off the end of the short side, with its face towards the headstock, and the next some few feet before the headstock is reached, with its face also towards the headstock, and the third light three feet before the end of the mule, at the long side, this may be attained. The latter reflector must also be placed so that it throws the light towards the headstock. Up to a very recent period, we are unaware that reflectors have been used to any large extent in weaving sheds. Why this should be, we do not know, as the annual gas bill is much larger in weaving concerns, than it is in spinning mills. Where the old system of lighting is used, it is necessary to have one jet to every pair of looms. We have been privileged to inspect a weaving shed where one gas jet, with reflector, gave satisfactory light for three pairs of looms, weaving 33 inch cloth—and also a case where one gas jet, with reflector, was employed to light two pairs of looms, weaving 40 inch cloth. The reflectors were, of course, placed over the middle of the weaver's alley, and the alternate system before noted employed. The only difference we noticed was that the lights were placed rather further from the ground than in spinning rooms. The lighting of sheds, where jacquard weaving is carried on, is always a question which requires anxious consideration; not only is there more machinery to illumine, but the harness



both absorbs the light to a not inconsiderable extent, and also is liable to cast undesirable shadows. The latter follow the absorption as a matter of course. Some manufacturers desire to have the jacquard machine lit up. We fancy, if reflectors were tried, one being placed over the weaver's alley, to every four looms, and one, only placed much higher, over the weaver's beam alley, to each four looms, satisfactory results would be given. As we have never seen this tried, we are unable to speak definitely, but from the results attained in other departments, we feel assured that something might be done on the lines indicated. It is now very usual to see winding frames, of some 30 feet in length, lit by two gas jets, with reflectors, placed one at each end over the alternate sides. They are generally placed 7 feet, or 7 feet 6 in. from the floor; on some very old makes of winding frames, the result is not as satisfactory as upon the newer makes, owing to the fact that shadows are cast, by some parts of the frame, upon portions where it is necessary to have a good light. It is, however, quite time that these old frames should be added to the scrap heap. For cloth looking, whether over a machine, or across a black board, or on a table, nothing is so good as a light with a top reflector, which throws down the light full upon the piece of cloth to be examined. Sometimes a Bunsen burner lamp is used with an opal glass top shade. These give a very soft, yet brilliant light, and for their purpose are highly to be recommended. From the observations we have made, it would seem that the discriminating use of reflectors permits a reduction of from half to two-thirds of the number of gas jets in use, with an illuminating result fully as good, if not better; whilst in extreme cases, under somewhat peculiar conditions, as many as five lights out of six may be saved. It may, however, be objected that reflectors are expensive, but at the price at which they may now be obtained, their cost will be repaid by the saving effected in two years; whilst in fitting up a new mill, it is found that the extra cost per light is about balanced by the smaller number of lights required.

### The Latest Styles for the Summer Season, 1887.

The summer season of 1887 bids fair to rival former seasons in the production of effective cloths, as regards texture, design, and colourings. Especially in those for gentlemen's wear are there likely to be some very tasteful fabrics, and more particularly in worsted, in which silk effects are largely introduced. Judging from the ranges of patterns now before us, and which we propose to describe as clearly as possible, the colourings of most of the materials will be, to a greater or lesser extent, more subdued than in the patterns we last described, although there will be many exceptions. In worsteds, the tendency in design will be to stripes (these being of a varied character), silk being woven in, in such a manner as to show forth prominently; the stripes are mostly from one-eighth to one-quarter of an inch apart, and the subdued stripes of duller colours, which are manipulated between these broader stripes, give a very pleasing effect. In some of the patterns, a broad check is produced in subdued colours across the stripes. Nearly all the designs are worked out by threads of silk, the ground being composed of the worsted. Dotted effects in silk, on a plain or fancy twill ground, are also likely to be in favour, but not so much so as formerly. In checks, the tendency is to small patterns, which are formed by threads of silk of contrasting colours running across each other, over a black, brown, or such like, dark ground. The colourings used are varied, but blue is not so prominent as has been the case during the past few seasons, it seems as if any combination would be accepted, providing neat and effective patterns are produced, without an undue prominence being given to any special colour, except in the production of the stripes before named. In many of the patterns, backings are used, these being of a light nature with regard to weight. In woollens, most of the ideas are in the duller shades of colouring—in stripes, checks, plaids, &c. In some patterns, a special feature is made of the finish, especially in the finer makes of fabrics. These are woven of a felty character and, after being finished, are soft, and partake of the nature of velvet to the touch, having what is generally known as the West of England draw finish. This tends to give the patterns an indistinct and

misty appearance when seen at a distance. In the Scotch cloths, of the cheviot and such like species, some brighter colourings are used, which are a contrast to those just described. Checks and plaids of a broken nature seem likely to have the run; these, although they show a distinct design in most cases, have still a rambling appearance in them quite foreign to recent productions. Silk will be less utilised in the woollen branches than formerly, although, in some ideas, it will be adopted as usual, but in less brilliant colours. The patterns of a striped nature will have the stripes mostly about one-eighth of an inch apart, the tendency being to lessen the distance; checks, except in Scotch fabrics, will be also rather less than usual, and the same may be said of plaid effects. In fabrics of a mixed nature, silk will be more or less introduced with worsted or woollen, but in lesser proportions than recently. The patterns for 1887 are, on the whole, equal to the average of the past three or four years, although in many respects they vary from the productions of recent times. In the April issue of "The Journal of Fabrics," we shall commence giving designs for cloths suitable for both ladies' and gentlemen's wear for summer 1887.

We have also before us a collection of new patterns for ladies' dress materials, but we are inclined to the belief that there is not much novelty displayed in them when taken as a whole. The kyle yarn again plays an important part in the construction of some of the materials, but it is questionable whether this yarn will be found to move in the market as quickly as hitherto, when made into goods. Kyle fabrics have had a long and successful run, and it becomes us to anticipate that trade must begin to droop in these materials, if, indeed, it has not already done so. One of the patterns before us consists of a web-like texture in fawn colour, with the most minute curls arranged in the warp, in stripes about five to the inch. It is a pleasing fabric for summer wear. A very pretty combination consists of a pale blue warp, and an olive green weft, which latter is so manipulated as to give to the ground a subdued effect of colour, a half cast between the warp and the weft colours; a very neat pattern is then raised upon the surface in olive, the curls being produced in the weaving, and not in the yarn previously, as has generally been the case. In another pattern, a somewhat novel effect is obtained by using a rich crimson warp, with a weft of a variegated yarn of crimson and fawn, which is thrown in close curls over the face of the fabric, whilst a second weft, of a rich lavender shade, forms a pretty ground effect when mingled with the warp shade. There are many patterns of thin materials, some of which nearly approach gauze in appearance. These materials are, for the most part, in self colours, but some of the thicker goods partake of the character of the hopsack pattern, and, in these, a mingled effect of colouring is employed. There are also one or two specimens of the lustre shaded effects; one, a particularly neat thing, having warp and weft of salmon and a delicate lavender. The neatest thing we have seen for some time is a pattern composed of a continuous and intricate key pattern, generally called an all-over effect. The colouring of this one is very chaste and harmonious, being of a bluish lavender warp, with weft of brown and gold. The three colours employed are about evenly distributed; the gold only coming up in a broken effect, and this being of silk, has a very pretty appearance. Some of the patterns before us are of very fine woollen material, containing plaids which are quite an inch and a half in size, and in a variety of colourings, such as crimson or blue on a fawn or *ficelle* ground, old gold or crimson on a lavender ground, old gold on a brown ground, &c. It appears likely that fawn and *ficelle* in the various shades will be still greatly in favour, and that lavender, with a variety of combinations, will be once more much affected by many. Before drawing our remarks to a close, we should call attention to the leno or gauze fabrics, which we have mentioned at various times in our pages. There is no doubt that this material will play a very important part in the summer (1887) trade in dress fabrics.

The third part of "Modern Ornamentation," by Dr. Chr. Dresser, Ph. D., &c., has been issued. It contains some excellent designs, and is, in every way, equal to the former numbers issued. Those of our readers, who are interested in the designing of ornamental fabrics, would do well to subscribe for this work.





The first plate contains a pleasing design, suitable for a Tapestry Fabric. It would look well coloured in the following manner. Ground—tan colour; leaves—a dark green, tipped with a light gold shade, in silk; the flowers might be in shades of crushed strawberry and peacock blue, or in other combinations of delicate colours that would harmonize well together. The framework of the panels should be subdued as much as possible. This pattern is the work of a very promising designer—Mr. F. Layton, York Terrace, Akroydon, Halifax.

Some of our readers have written to us expressing very favourable opinions upon our introducing into our pages the larger class of designs, such as dress goods, upon point paper, and desiring us to give such designs from time to time. One of our subscribers goes further, and asks that a sketch of designs should be given in the proper size in which it would appear when woven. In accordance with this last suggestion, we give a pattern for Dress Goods on our second page, where also will be found the sketch of same in cloth size. It should be woven with 60 picks to the inch. The ground and figure tie are not indicated.



**Cotton.**—A rather quiet month has been experienced in this branch of trade. In the spinning departments, the same unsatisfactory state of business has existed as has been the case for some time past. Nearly all classes of yarn spinners have worked at a loss, and there are no signs of an early improvement in this respect, as the production exceeds the demand in more than an ordinary degree. This being the case, manufacturers have only purchased to cover their present needs, for, as a rule, yarns of any required description can be had at a day's notice. The tendency of prices has been to still lower rates. The demand for cloth has not improved, but rather the reverse, with the result that prices have gone against the seller. Indian fabrics have been in fair demand, and at low rates, as heavy stocks are in the markets, and the production is large. The prospect for the early future is anything but cheering, and before there are any signs of stability in demand and prices, large quantities of goods, now on hand, will have to be put upon the market to make room for new productions.

**Woollens.**—This branch, owing, perhaps, to the bright, keen weather, has slightly improved in some departments. In the heavy woollen districts, many stocks that were on hand have been lessened. Light woollens of a fancy character, and in light shades, have met with much attention, and numerous orders have been secured for them. The best makes of worsteds, for coatings and mantles, have also met with success, although manufacturers have generally had to make concessions in prices. The patterns which have met with most favour have a striped effect, produced by a thread of silk, running straight through the cloth. In the medium qualities of worsteds and woollens, only a moderate business has been transacted. In the lower qualities, trade has kept up to an average, although rates are now so low as to leave but little margin for profit. In tweeds, chevots, and such like cloths, more subdued colourings are being used, of course, there are many exceptions, but the run is on duller shades. The finer qualities of tweeds, &c., are now having, what is termed, a draw finish, which gives a very smooth touch to the cloth. This class is likely to meet a good demand during the ensuing few months.

**Linen.**—There is no improvement to note, in this branch, of any moment. Certain classes of goods have met with a fair demand, whilst others have been much neglected. In the Barnsley district, trade has been unsatisfactory, and, generally, unremunerative, and shows no signs of improvement. In the Belfast district, the feeling towards the end of the month was of a more cheerful nature, but business is not in any

manner encouraging. Jute fabrics have been slow of sale, and the tendency of prices has been downwards, although the demand has varied during the month. Flax has been in fair request with hardening prices, and this branch has shown a more hopeful aspect.

**Wool.**—The trade, on the whole, has been of a quiet character, but, towards the end of the month, business improved slightly, and prices had a hardening tendency. Imported wools also sold more freely, and rates ruled steady. A general feeling seems to exist, that prices will now be more settled, and have, probably, an upward movement. In skin wool, rather more was sold at firm rates. In the yarn branches, trade has not been so favourable as during the past few months, and the orders put upon the market have been at reduced prices. The botany departments have kept fairly busy, but new orders are not so remunerative as formerly. The piece trade has been quiet, with the exception of that for America, which has been fairly good. Inquiries for the Continent have been meagre, on the whole, and show no signs of an early amendment.

**Lace.**—This branch of textiles bears very few hopeful signs. In plain goods, a fairly good business has passed during the month, and prices have been slightly more remunerative, and there are signs of further improvement, but in fancy goods the demand keeps dull, and prices have not left any margin for profit. In the curtain branch, no new feature can be reported, and although manufacturers, by the production of elegant designs, have sought to meet the taste of buyers, they have been unable to make much impression on them, and, in consequence, much machinery is standing idle, and it seems probable, unless things take a speedy turn for the better, that more short time will be the rule. Prices are very low, and as to profit, it may be said to be *nil*.

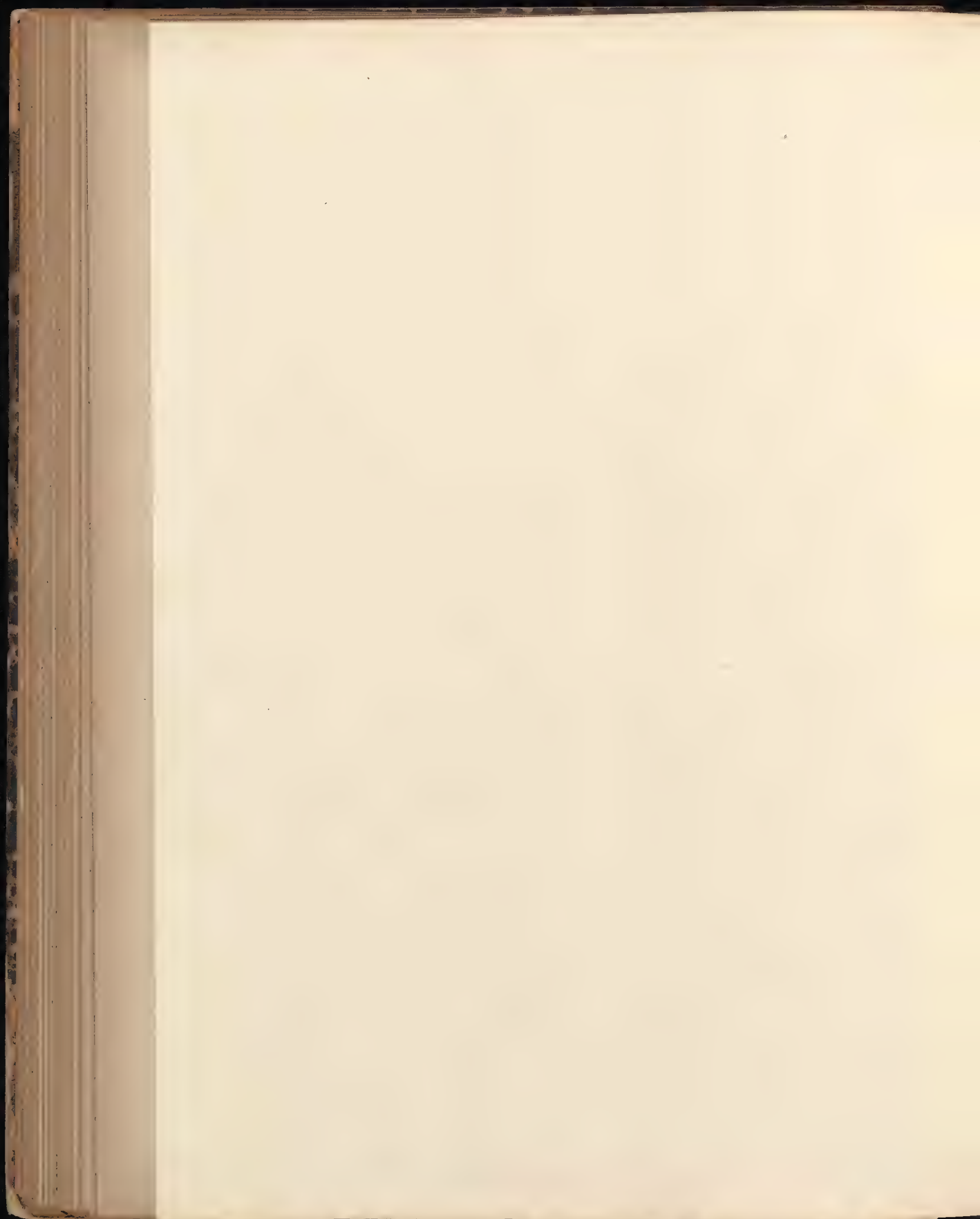
### Fashions in Dress Goods.

The following is taken from "Myra's Journal of Dress and Fashion":—"Although canvas-woven fabrics still undoubtedly lead the way in the new woollen materials for the coming spring and summer, there is very little similarity between those which manufacturers are now producing, and the canvas and étamines of last year. Many fancy weavings have been introduced, some of them resembling fine, close network, others more like the stitches seen in point d'esprit and other nets, while the plain canvas-woven fabrics are coarse in appearance, but exquisitely soft in texture. On the whole, the new canvas materials are not only more varied, but they have also gained in practical qualities, and are likely to be found more durable and satisfactory in wear than the loosely woven étamines, which caused so much disappointment last year. There is no trace left of the exaggerated roughness of texture that has of late disfigured so many otherwise beautiful fabrics. With one or two exceptions, hairy surfaces are at a discount, and even the new vigognes have an unwonted smoothness that, in addition to their exquisite fineness and softness, makes them more admirable fabrics than ever for spring walking costumes. This improvement in texture is accompanied by a very marked increase of taste in colouring.—"Le Moniteur de la Mode" says:—"The new woollen materials for the season are highly to be commended for their beauty. Woollen étamines are largely represented, but they are infinitely superior to the regular square network of woollen threads so fashionable last year. The novelty of the season is a fancy étamine, as light as gossamer, formed by the crossing and recrossing of thousands of minute woollen threads, producing a lovely web-like fabric, which drapes most beautifully. This étamine, called emphatically the new canvas, is striped and chequered with plush lines of the most lovely colours, the ground being a dark *fiole* colour, which promises to be very fashionable. It is also striped horizontally with rich, wide terry stripes, in delicate æsthetic colours. Here, let it be remarked, that a distinct feature of the new woollen fabrics is that they are striped horizontally instead of vertically, and that, as a rule, the stripes are at least in two colours. The plush stripes on étamines are in many widths, generally in two colours, both differing from the ground. There is also a very novel variety of canvas used for skirts only. The new canvas is darned with thick woollen threads horizontally, giving the effect of rows of Russian braid.





TAPESTRY.



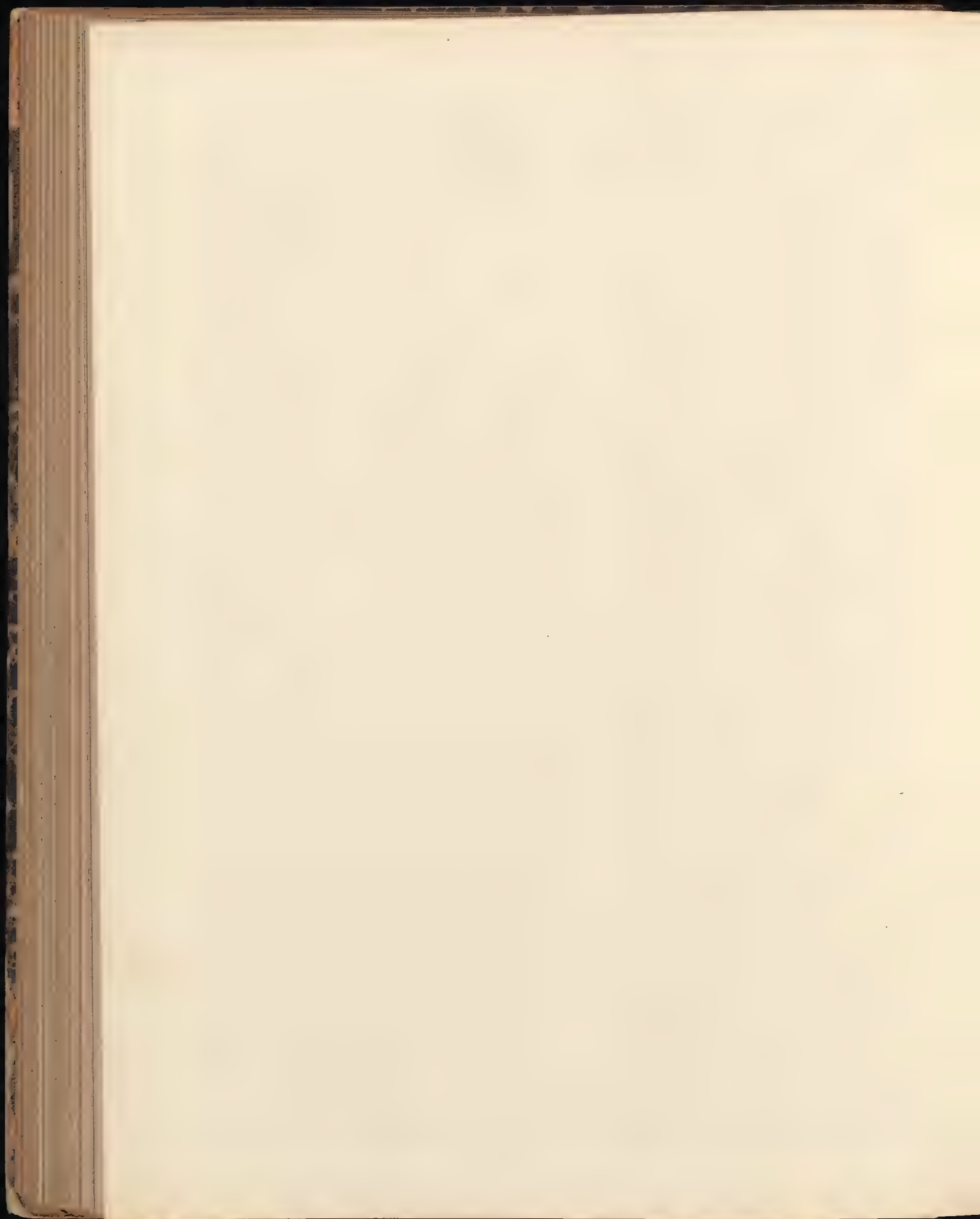


THE JOURNAL OF FABRICS AND TEXTILE INDUSTRIES.

12TH MARCH, 1886.



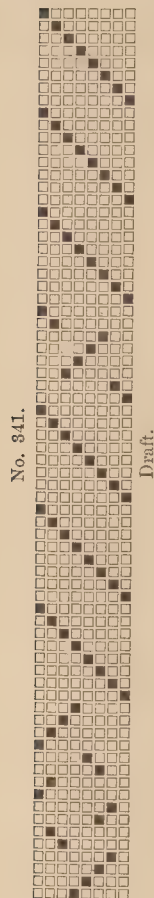
DRESS GOODS.





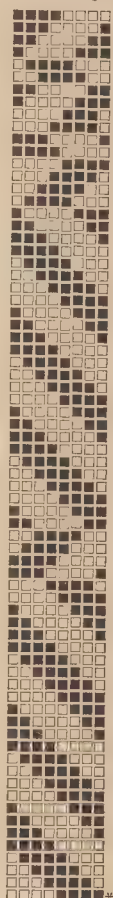


## Chebriot.



No. 341.

Draft.



Weft:

Same as warp, but the fawn darker in colour.

1400 ends.

39 picks per inch.

4 ends in a reed.

70 inches wide in the loom.

50 to 56 inches wide when finished.

Smart and bright finish.

Warp and weft 450 yards per oz. twisted hard.

Warp:

8 Black

1 Crimson

3 Red Fawn.

4 Red Fawn.

3 Black.

2 Green.

3 Yellow.

3 Black.

4 Red Fawn.

56

## Coatings and Suitings.

No. 342.

Warp:

1 Black worsted, 2/50.

1 Claret " "

9 Black " "

1 Claret " "

9 Black " "

1 Claret " "

7 Black " "

3 Claret " "

1 Dark Brown, " "

6 Black, " "

3 Medium Brown, " "

1 Dark " "

6 Black, " "

3 Medium Brown, " "

1 Dark " "

7 Black, " "

Design.

4,025 ends.

118 picks per inch.

5 ends in a split.

11½ reed.

70 inches wide in the loom. 60 ends and picks.

56 " when finished.

No. 343.



Design.

Warp:

2 Black worsted, 2/40.

1 " woollen, 29 skeins.

2 " worsted.

1 " woollen.

2 Brown worsted.

1 " woollen.

2 " worsted.

1 " woollen.

12 ends and picks.

5,040 ends.

74 picks per inch.

6 ends in each split.

12's reed.

70 inches wide in the loom.

56 " when finished.

No. 344.



Design.

Warp:

1 Black worsted, 2/50.

1 " woollen, 17 skeins.

1 " worsted, 2/50.

1 White worsted,

1 " woollen,

1 " worsted,

Threads 18.

Weft:

1 Black worsted.

1 " woollen.

1 " worsted.

1 White silk.

1 " woollen.

1 " silk.

5,508 ends.

92 picks per inch.

6 ends in a reed.

68 inches wide in the loom.

56 " when finished.

18 picks.

No. 345.



Design.

Warp:

1 Black, self twist, 12 skeins.

1 Olive, " "

1 Black and Crimson, " "

1 Black, self twist, " "

1 Olive, " "

1 Olive and Orange, " "

6 ends.

2,100 ends.

35 picks per inch.

3 ends in each split.

10's reed.

70 in. wide in the loom.

56 " when finished.

Weft:

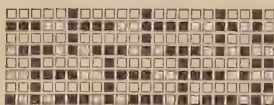
1 Black, self twist, 12 skeins.

1 Brown, " " "

1 Black &amp; Green, " " "

3 picks.

No. 346.



Design.

Warp:

1 Black worsted, 2/50.

1 Brown " "

1 Black back, 21 skeins.

1 Brown " 2/50.

1 Black " "

1 Back, 21 skeins.

2 Black back, 2/50.

1 Back.

2 Black.

1 Back.

1 Black.

1 Blue silk.

1 Back.

1 Orange silk.

1 Black.

1 Back.

2 Black.

1 Back.

2 Black.

1 Back.

Repeat to 46 ends and picks.

Instead of Blue and Orange silk  
place Crimson and Green.

5,474 ends.

100 picks per inch.

3 dent with 6 ends.

1 " 5 "

14's reed.

68 inches wide in the loom.

56 " when finished.

## The Proposed New Tariff Bill for the United States.

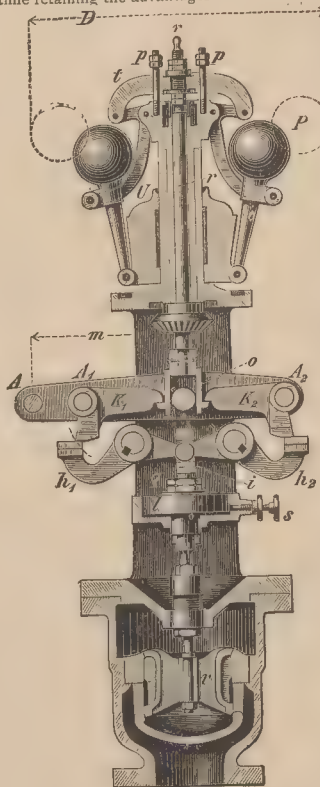
A bill to amend the United States tariff laws has at last been introduced by the Chairman of the Ways and Means Committee. The following are the details of the bill respecting textile fibres and fabrics:—*Cotton and Cotton Goods*.—Cotton thread, yarn, warp yarn, whether single or advanced beyond the condition of single, by twisting two or more single yarns together, whether on beams or in any other form, valued at not exceeding 25 cents per pound, 8 cents per pound; over 25 and not exceeding 40, 13 cents per pound; over 40 and not exceeding 50, 16 cents per pound; over 50 and not exceeding 60, 20 cents per pound; over 60 cents and not exceeding 70, 27 cents per pound; over 70 cents and not exceeding 80, 32 cents per pound; over 80 cents and not exceeding \$1. 36 cents per pound; over \$1. 40 per cent., ad valorem. On all cotton cloth not bleached, dyed, or coloured, &c., and not exceeding 100 threads to the square inch, counting the warp and filling, and exceeding in weight five ounces per square yard, 2 cents per square yard; if bleached, 2½ cents per square yard; if dyed, coloured, stained, &c., 3 cents per square yard. On all cotton cloth, not bleached, dyed, or coloured, &c., exceeding 100 and not exceeding 200 threads to the square inch, counting the warp and filling, 2½ cents per square yard; if bleached, 3 cents per square yard; if dyed or coloured, &c., 4 cents per square yard; provided that, on all cotton not exceeding 200 threads to the square inch, counting the warp and filling, not bleached, dyed, coloured, &c., valued at over 8 cents per square yard; bleached, valued at over 10 cents per square yard; dyed, coloured, &c., valued at over 13 cents per square yard, there shall be levied, collected, and paid, a duty of 35 per cent., ad valorem. On all cotton cloth exceeding 200 threads to the square inch, counting the warp and filling, not bleached, dyed, coloured, &c., 3 cents per square yard; if bleached, 4 cents; if dyed, coloured, &c., 5 cents; provided that, on all such cotton cloths not bleached, dyed, coloured, &c., valued at over 10 cents per square yard; bleached, valued at over 12 cents per square yard, and dyed, coloured, &c., valued at over 15 cents per square yard, there shall be levied, collected and paid, a duty of 35 per cent., ad valorem; 40 per cent., ad valorem, on cloths less than 100 threads to a square inch, and less than five ounces in weight, and no duty on the above over 40 per cent. Spool thread of cotton, 6 cents per dozen spools, containing on each spool not exceeding 100 yards of thread; exceeding 100 yards on each spool, for every additional 100 yards of thread or fractional part thereof in excess of 100 yards, 6 cents per dozen. *Hemp, Jute and Flax Goods*.—Brown and bleached linens, ducks, canvas, diapers, huckabacks, handkerchiefs, lawns, or other manufactures of flax, jute or hemp, or of which flax, jute or hemp shall be the component material of chief value, not specially enumerated or provided for in this act, or the act of March 3, 1883, 30 per cent. ad valorem. Flax, hemp and jute yarns, 30 per cent. ad valorem. Flax or linen thread or twine, or packed thread, and all manufactures of flax, or of which flax shall be the component material of chief value, not specially enumerated or provided for in this act, 35 per cent. ad valorem. Oil-cloth foundations, or floor-cloth canvas, or burlaps, exceeding sixty inches in width, made of flax, jute or hemp, or of which flax, jute or hemp, or any of them shall be the component material of chief value, 35 per cent. ad valorem. Oil-cloths for floors, and all other oil-cloth, except silk oil-cloth, and waterproof cloth, not otherwise provided for, 35 per cent. ad valorem. Gunny cloth, not bagging, valued at 10 cents or less per square yard, 2 cents per pound. Bags and bagging, and like manufactures not specially enumerated or provided for in this act, except bagging for cotton, composed wholly or in part of flax, hemp, jute, gunny cloth, gunny-bags, or material, 35 per cent. ad valorem. Bagging for cotton or other manufactures not specially enumerated or provided for in this act, suitable to the uses for which cotton bagging is applied, composed in whole or in part of hemp, jute, jute butts, flax, gunny-bags, gunny-cloth, or other material, and valued at 7 cents or less per square yard, at one cent per pound; valued at over 7 cents per square yard, 1½ cent per pound. *Wools and Woollens*.—Wools of the third class, such as Donskoi, native South American, Cordova, Valparaiso, native Smyrna, and including all such wools of like character as have been heretofore usually imported into the United States from Turkey, Greece, Egypt, Smyrna, and elsewhere, 2½ cents per pound. Woollen cloths, woollen shawls, and all manufactures of wool of every description, made wholly or in part of wool, not specially enumerated or provided for in this act or the act of March 3, 1883, valued at not exceeding 80 cents per pound, 25 cents per pound and 30 per cent. ad valorem. Flannels, blankets, hats of wool, knit goods, and all goods made on knitting frames, balmorals, woollen and worsted yarns, and all manufactures of every description composed wholly or in part of worsted, the hair of the alpaca goat or other animals (except such as are composed in part of wool) not specially enumerated or provided for in this act, valued at not exceeding 30 cents per pound, 8 cents per pound; above 30 and not exceeding 40 cents, 10 cents per pound; above 40 and not exceeding 60 cents, 16 cents per pound; above 60 and not exceeding 80 cents, 20 cents per pound; and in addition thereto upon all the above-named articles 35 per cent. ad valorem. Women's and children's dress goods, coat linings, Italian cloth, and goods of like description, composed in part of wool, worsted, the hair of the alpaca goat or other animals, valued at not exceeding 20 cents per square yard, 5 cents per square yard, and in addition thereto 30 per cent. ad valorem; valued at above 20 cents per square yard, 7 cents per square yard and 35 per cent. ad valorem; if composed wholly of wool, worsted, the hair of the alpaca goat, or other animals, or of a mixture of them, 8 cents per square yard and 35 per cent. ad valorem; but all such goods with selvages made wholly or in part of other materials, or with threads of other materials, introduced for the purpose of changing the classification, shall be dutiable at 8 cents per square yard and 35 per cent. ad valorem; provided, that all such goods weighing over four ounces per square yard shall pay a duty of 35 cents per pound and 35 per cent. ad valorem.

## MACHINERY, TOOLS, &C.

### The Proell Automatic Expansion Gear and its Application to New and Existing Engines.

The Proell Automatic Expansion Gear, which is described in the following article, has been brought before our notice by Messrs. Roby and Co., Engineers, Lincoln, who are the sole licensed manufacturers of this apparatus for England. The description here given, constitutes a portion of a reprinted paper sent to us, and as no better explanatory article could be written, we print it by permission of Messrs. Roby and Co.

The Proell Gear has been constructed with a view to supplying a perfectly automatic variable expansion apparatus, having the least possible number of parts, with the shortest practicable travel, in order to allow them to be made strong and compact, while having large wearing surfaces; at the same time retaining the advantages of automatic variable expansion. Almost any kind of valves may be used to effect the cut off of the steam.



The Proell "One-Valve" Expansion Gear.

Every, which has been found to answer to best advantage, in connection with this particular gear, is the ordinary double beat equilibrium valve. The application of the system to new engines is usually as follows, taking a horizontal engine by way of illustration: Near each end of the cylinder is arranged an equilibrium valve in such a manner that, in being raised, it allows steam to pass from a steam chest, through a very short port underneath the piston. The valves are raised by the two armed levers, called the lifters,  $h_1$  and  $h_2$ , which, on being released, are depressed again by springs, that are enclosed in cylindrical cases and air-cushions, by which latter, the falling movement of the valve is modified, so that a gentle closing of the valve is effected. The alternate opening of the valves for the variable lengths of time required by the work on the engine is now effected in the following way:—A lever  $A$  receives an oscillating motion from an eccentric, on the main shaft, by means of an eccentric rod giving an oscillating movement to a hanging arm. It may here be mentioned that the oscillation of the lever  $A$  at its ends ranges from  $\frac{1}{2}$  in. in apparatus of 2 in. valves, to  $1\frac{1}{4}$  in. with 9 in. valves, the largest that have as yet been applied. The lever  $A$  carries at each end bell-crank shaped "cut-off pieces,"  $K_1$  and  $K_2$ , which hang freely on studs provided at each end of the lever. In this way they are compelled to follow the up-and-down movement of the lever  $A$ , and, in consequence, the lower edges of the steel faces describe approximately an arc of a circle, whose centre is that of the shaft which carries the rocking lever. It will, therefore, be clear that, in going down, the steel face of one of the bell-cranks will come in contact with the opposite steel face of the corresponding lifter, depress the same, and, thereby, raise the valve from its seat, until the two steel faces leave each other, when the valve is released and closed by the tension of the spring within the air-cushion. The other bell-crank will, in the meantime, have risen to the same extent as the former one was depressed, and its vertical steel face will have come into contact with the vertical edge of its own lifter. Being free to turn on its stud, the effect will be that its inner end rises, and, after the two steel faces have passed one another on the return of the bell-crank, the latter falls back into place by the weight of its tail end, and rests upon the support formed by the fork  $O$  of the governor rod. If we now suppose for a moment that this support were a fixed point, it is evident that an invariable cut off would result, as the overlap of the steel faces, and, in consequence, the time, during which the valve is kept open, would be the same for each stroke of the engine. Now it is that the action of the governor comes into play. The tail ends of the bell-cranks rest, by their own weight, on a fork  $O$  forming part of the



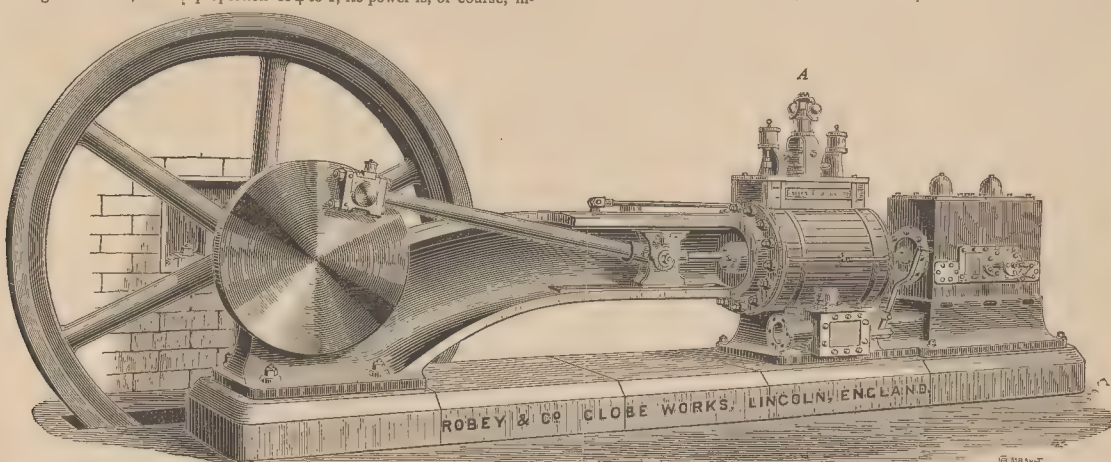
governor rod, and the governor, therefore, determines for each stroke of the engine what shall be the overlap of the respective steel faces. This overlap will be the largest, and consequently the steam will be carried farthest on the stroke, when the governor is down; and, it may be mentioned, that the maximum amount of this overlap varies from  $\frac{1}{8}$  in. in the case of a 2 in. valve, to  $\frac{1}{4}$  in. in that of a 3 in. valve. It is within this very limited range that all the variation of the expansion is contained, which determines automatically the alteration of the cut off between absolutely nil, and admission of the steam to nearly three-fourths of the stroke. The proportions of the lengths of the two arms of the bell-cranks being about 1 to  $\frac{1}{2}$ , it will be seen that the total lift of the governor rod, to withdraw the steel faces from one another (from the widest overlap until, at the highest position of the governor, the faces do not come into any contact), ranges, for the 2 in. to 3 in. valve apparatus, from  $\frac{1}{8}$  in. to about  $\frac{1}{4}$  in. This very short travel, thus required of the governor rod, allows of a peculiar construction of the governor itself; and it will be seen that this has been taken advantage of by reducing the opening of the governor balls, or the resulting lift of the counter weight, as compared with the lift of the governor rod, in the proportion of about 4 to 1, by giving the hanging straps of the governor balls the shape of suitable angle levers, and uniting them at the top by a cross bar *l*, which, within a hardened steel bush, carries the governor rod. By thus reducing the travel of the governor rod, in the proportion of 4 to 1, its power is, of course, in-

effected in these engines either by slide valves, worked by the same eccentric, or by equilibrium valves below and at the end of the cylinder. The rate of steam consumption in these engines is very low, as will be seen from the following examples, the figures having been ascertained from installations at work by means of careful evaporation trials.

Type of Engine.	H.P. ind.	Cut off.	Steam consumption.
Non-condensing,	40	0.28	33
Condensing,	160	0.16	20
Compound Condensing,	160	0.28	16
Do.	400	0.23	14

The steadiness of speed is as perfect as any engine can produce, which depends for its governing on the effects of the variations of speed on a governor. Only in one instance (to which reference will be made later on) has the system so far been brought under the exacting control of the Moscrop Continuous Speed Recorder—there, however, with very gratifying results. By the common process of counting the revolutions, it is very hard to ascertain the slightest difference in speed, no matter whether part, or the whole load, comes suddenly on or off an engine of this construction, as is borne out by many installations driving such variable loads as wire mills, printing establishments, electric lighting, etc.

(To be continued).



Engine made by Messrs. Robey and Co., shewing the Proell Expansion Gear at A.

creased in an inverse ratio; and supposing that a certain alteration of speed would produce an available power of 1 lb. in the governor weight, a power of 4 lbs. would result in the governor rod for the purpose of altering the rate of expansion. The power exerted by the different sizes of the governor, from the smallest to the largest, at a variation of speed from one per cent. in the counter weight of the governor, ranges from 1 lb. to 2 lbs.; thus, in the governor rod, a power is available from 4 lbs. to 8 lbs. respectively at the very slightest variation of speed in the engine. Considering now that the power required to lift the valves is entirely given out by the rocking lever *A*, and that the sole duty of the governor is to set the bell-cranks for the proper overlap of the steel faces, this power of the governor is amply sufficient for the purpose; and, moreover, it becomes possible to apply comparatively small governors for the control of large engines. This very desirable object has been obtained by actually working the valves in a compulsory manner from an eccentric, while controlling the duration of their opening by a sensitive governor, which is relieved from all work. The peculiar suspension of the governor balls results in the governor being as nearly as possible astatic, and the power exerted by the governor is the same in any position, whether high or low. As regards speed, the governor may be classed between the old Watt governor and the modern high speed governors, its respective rates of revolutions ranging from 180 per minute in the smallest, to 120 in the largest. The great sensitiveness of the governor being liable to make the governor "hunt," a suitable moderating power is required to prevent it from jumping through its whole range at the slightest provocation. This has been attained in a very simple and neat manner, and with the most perfect success. The governor spindle, on which the counter weight revolves, has been made of two different diameters, so that, in rising or falling, the annular air-space thus created is increased or decreased. By means of a suitable set screw, the exit or inlet of air into this annular space can be regulated at will, and thus any suitable degree of sensitiveness may be obtained best suited to the particular engine, and the condition under which it works. It may still be mentioned that, by adding weights on the top or below the governor rod, the regular constant speed of the engine may, at will, be increased from its minimum by about 50 per cent. while the engine is running, and this has been found to answer very well in special manufacturing processes, where such an occasional alteration of the normal speed was required. It may, perhaps, be counted as an advantage, in the construction of the governor itself, that the application of any springs has been entirely avoided, and only the arrangement of centrifugal force, as against suspended load, is relied upon. The exhaust of steam may be

### Associated Chambers of Commerce.

ON the 24th ultimo, the twenty-sixth annual meeting of the Associated Chambers of Commerce of the United Kingdom commenced at the Westminster Town Hall, Mr. C. M. Norwood in the chair. The report of the Executive Council for 1885 was laid before the meeting, and regret was expressed that, owing to Parliament having been so occupied with exciting political measures, little attention could be paid to commercial matters during last session; and feeling this, the Council did not attempt to introduce any of the measures prepared at the instance of the association. Reference was made to the bills introduced into Parliament last year, by the principal railway companies, for dealing with rates and charges; and satisfaction was expressed that those bills had not become law. The report also dealt with the subject of canals, Indian railways, foreign judgments, the treaty of commerce with Morocco, the working of the Bankruptcy Act of 1883, the registration of deeds of arrangement, the appointment of a Minister of Commerce, the reconstruction of the Board of Trade, the extension of foreign trade, local Parliamentary inquiries, the publication by Government of information bearing on the trade and commerce of the nation, the rating of machinery, harbours of refuge, light dues, the Parcels Post, telephonic communication, the Carriage tax, the Bills of Exchange Registration Bill, foreign tariffs and commercial treaties, and the Royal Commission on Depression of Trade. Perhaps the most important resolution which was proposed at the meeting, and the one most interesting to our readers, was that in reference to retaliatory duties, which Mr. Peters, on behalf of the Derby Chamber, moved—"That the association is of opinion that this country should, without further



delay, adopt a general tariff of import duties, which should only be put in force against those nations that do not grant to British goods the terms conceded to the most favoured nation."—Sir Jacob Behrens submitted that the resolution, being of a general character, was irregular; but the objection was overruled.—Mr. Wolfe (Hull), in seconding the motion, thought it did not go far enough. He should have been able to give it more cordial support, if it had contained a clause asking the association to memorialise the Cabinet to inquire into the whole fiscal tariff of this country, and, once and for all, to set this vexed question at rest.—Mr. Firth (Heckmondwike) looked upon the motion as unsatisfactory, inasmuch as it referred to a general tariff of import duties to be levied under certain circumstances. The view of his chamber was that a general tariff that might avail as retaliation against one country might not be a policy of retaliation against another. He thought the motion would be improved if a clause were inserted providing for its being officially communicated to the Government; and he moved that the resolution should read as follows:—"That the Association of Chambers of Commerce is of opinion that this country should, without further delay, adopt a policy of retaliation against those countries that do not grant to Great Britain the terms conceded to the most favoured nation; and that the Council communicate this resolution to the Prime Minister and the Foreign Secretary."—The mover and seconder having, on behalf of their respective chambers, accepted the amendment, the meeting continued the discussion of the resolution as amended.—Mr. Sampson Lloyd moved to substitute the words "fairly reciprocal fiscal treatment" for the words "terms conceded to the most favoured nation."—Mr. Swire Smith (Bradford) said it seemed to him that in this country, whose principle had long been held to be Free-trade, there should now be no faltering as to that principle. More trade was what we were crying out for in the present depression, and what would placing an import duty upon foreign goods do but diminish trade? He would ask his hearers to contemplate the effect of that upon the shipping trade. Now, as regarded Spain, all knew that she was treating us very badly, but Spain said that she had a grievance, and was only retaliating it upon us, considering that we did not treat her fairly in the matter of the wine duties. We knew that Spain materially hurt herself by her policy, and yet the Derby Chamber asked us to imitate her example—the most backward of European manufacturing countries. Now take America. If you were not going to place a tax upon food among her exports to us, how much would you find in manufactured goods to tax? An insignificant sum. He had represented Bradford some years ago upon a Royal Commission to inquire into the alleged superiority of foreign goods. The Commission travelled all over the Continent, and came to the conclusion that it was not lower wages, or longer hours, but the superior attractiveness of design, due to special training of the workmen, that was bringing foreign goods to the front. In one small town they found a weaving and dyeing school which had cost £45,000, and £8,000 a year to maintain it. The inhabitants said, the English paid it by buying their goods. What had Derby, which complained of its vanished trade, to say to that?—Sir Jacob Behrens (Bradford) thought that the question should be treated practically rather than scientifically, and, further, that they should first make sure that the trade was leaving the country. As to the textile industry, he could speak with some certainty, and could assure the meeting that in 1884 there was more trade done in this branch of industry than there ever had been before.—The Chairman put the resolution and amendment to the meeting, and both were negatived.

### Inventors versus Patent Pirates.

"We will manufacture any patented article which comes within the scope of our business; Let the inventor stop us; We are ready to risk the consequences." A remark of this nature was lately made in our hearing by a member of a firm of some standing in their particular branch of business, and we venture to assert that the defiance, to the patent laws, expressed in the above words, is openly acted upon daily by many business men. The question of the Inventor *versus* the Patent Pirate is one which we consider requires careful attention from our legislature;

they have given us a patent law which, so far as regards cheapness and easy terms of payment, comes within the range of almost all men. But let it be noted, that the question of the infringement of a patent must be decided before a court of law, a court which, in its action, is expensive to the last degree. Of what benefit is it then for the poor man to patent an article, which may have cost him months or perhaps years of study, when he lacks sufficient money to prevent the unprincipled man from manufacturing his patented article, or, if not the actual article, yet one so near in principle, or construction, that it is practically the same? What remedy can he employ in such a case as this? The inventor may demand that the infringement should cease, but in case of further open defiance, he must take the matter to a court of law, and should there be, as is generally the case, intricate points to decide, the action may require several days in the hearing, and with what result? By the uncertainty of the law, a verdict may be given for the defendant, which means that the plaintiff (the inventor) may find himself in the unenviable position of the payer of costs. But such a case should be impossible, because the question, of an article possessing sufficient merit or novelty to be patented, should be properly decided by the authorities before the patent is granted, and, when a patent is once sealed, its validity should be upheld. But supposing the verdict is for the plaintiff. The defendant may possibly take the case to another court, or make various applications with a view to a reversal of the verdict, all the time adding to the costs, which, in the end, the plaintiff may find he has to pay. It may, however, be said that if an inventor has a good case for the court, he should have no fear of the result. This argument may do very well for the well-to-do patentee, but the poor man must always first count the possible cost of an action, and this is often sufficient to deter him from commencing proceedings against the pirate. Yet another thought occurs in dealing with this subject. It is, perhaps, chiefly, the man of money who infringes; but should it be one equally as poor as the inventor, and supposing the verdict to have been given for the inventor, and the costs being heavy, the defendant cannot pay, and bankruptcy is the result, then who pays the costs? A case lately heard in court lasted, we believe, about 18 days, and many similar cases could be cited. Counsel were engaged, and all the regular machinery of the law was in full motion. In the end, a verdict was given for the plaintiff. In making a further application to the court relative to the case, it was hinted by defendant's counsel that the original verdict meant bankruptcy for the defendant, and such an ending to a case is equally possible for a plaintiff. We may here mention a little incident which lately came under our notice. We were in conversation with a machinist, who mentioned a patent which he had lately obtained for an article, which article, he said, he had had on hand for a considerable time. When asked why he had not earlier obtained a patent for it, he replied, I had not enough money to defend it in case of infringements, and have kept it to myself until I had amassed, by my regular business, a sufficient sum for that purpose. This case points to the evident suspicion of patent pirates which exists in the minds of inventors. It is a question whether the present mode of settling the question of an infringement of a patent is the best which could be adopted, even supposing the costs were reduced to a minimum. To our mind, they would be much better, and more easily decided, if referred to a board of experts, attached to, and forming part of, the machinery of the patent office. Under such an arrangement, settled fees might be payable for the various stages through which a question in dispute might be required to pass. Thus, the patentee would be able to calculate the cost of an action for infringement before he commenced it, and, altogether, the law of patents and of infringements of them, would, to use a well-known figure of speech, be "in a nutshell." In conclusion, there is one more aspect of the case which may be mentioned. Supposing an article patented is for use in factories, or other places of business; the master of such a place may make the article himself, for use within his own premises, and in the case of such an infringement, its coming to the notice of the inventor is a question of chance in most cases; and thus the patentee may be defrauded wholesale. Some provision should be made for the more easy detection or prevention of such cases, which, there is no doubt, do occur continually.



## Calico Printing.

Mr. Antonio Sansone, the teacher in the department of bleaching, dyeing, and printing, at the Technical School, Manchester, has given the second of two lectures on the different styles in calico printing. At the commencement of his address, Mr. Sansone alluded to several old methods of printing, including the most ancient, which involved the use of beeswax, and that of a more recent period, in which engraved copper plates were employed. The use of these plates was, he said, a matter of great historical interest, for to this method was due the invention of the roller printing machine. The first attempt to print calico goods in England was made with the object of imitating the Indian fabrics, which were at one time largely imported into England. First, calico was imported from India and printed in this country; then yarns were imported, woven into cloth, and the cloth printed; and, finally, the cotton itself was imported, and the whole of both the manufacturing and printing processes were gone through here. Referring to the production of turkey reds, he said he could see no reason why, in the future, these reds should not be printed by a direct process, as was the case with other colours. The dyed colours were, he considered, the colours of the past and of the present, whilst the direct, or printed colours, were the colours of the present, and, he hoped, of the future. It seemed to him that, as we now possessed knowledge about printing and about colouring matters which was not possessed by our forefathers, colours ought always, in the future, to be fixed by a direct process. The application of direct colours was, in his opinion, the method which would be followed in the future, and calico printing would go little by little into steam styles. All the colours which were now produced by dyeing would, in his opinion, be produced in the future by direct printing. The application of steam colours had not undergone much change during the past few years, but what change there had been was with regard to coal-tar colours. The most interesting change was the introduction of alizarine. The alizarine blue was one of the best known substitutes for indigo, only it was not so cheap as the natural article, and he believed it would be a good thing for the printing industry if it could be more cheaply applied. There was, however, no real substitute for indigo, and it would be very difficult to find an artificial colouring matter which would stand the same treatment as indigo did. Up to the present time, indigo was the only real fast colouring matter which was known in the blue classes. Touching again on the production of turkey-reds, the lecturer remarked that it was a well-known fact that such bright reds could not be produced by the printing as by the dyeing process, but this difficulty, he believed, would eventually be overcome. The tendency, at the present time, was in favour of fast colours and good materials, and particular attention ought to be paid to the styles derived from aniline colours. Some difficulty had been experienced with regard to aniline colours, but by employing good materials and proper apparatus this difficulty ought to be easily overcome. Aniline was one of the cheapest colours that could be used, and it was an open question whether it was not cheaper than logwood. One of the most important matters in connection with calico printing was the improvement which had, in recent years, taken place in the machinery used. The production of printed calico goods in England was at present equal to that of all the other countries combined. In quality, also, the goods made in England equalled, if they did not excel, those manufactured elsewhere. Progress on the Continent in this industry had, however, been very rapid during the past 20 or 25 years. This was due to the well-appointed schools and laboratories, in which a good technical education was given, and it seemed to him, that if this country desired to retain its present position, similar provision would have to be made here, for the proper teaching of technical subjects. To some extent the necessity of this had already been recognised, but the existing provision would need very largely extending, if in the future, we were to be able to compete with foreign manufacturers. To illustrate his lecture, Mr. Sansone exhibited a collection of calico prints, extending over the last hundred years, from the museum in Peel Park; specimens of printed cretonnes and hangings lent by the Rosendale Printing Company; a Genoese hanging, dated 1540; an old Indian print, and sample books of the beginning of the present century, lent by Sir J. C. Lee; sample books of

the last ten years, lent by Messrs. Salis Schwabe and Co.; printed velvets, and a sample of printed linen from copper plate, dated 1780, lent by Mr. J. Lamb; and a large diagram contrasting the state of the calico printing industry in 1885 and 1874, which had been prepared in the school.



The present condition of the German jute industry is very unsatisfactory, owing to overproduction. At a meeting of jute manufacturers, owning about 80 per cent. of the total number of German jute spindles, held recently in Berlin, it was resolved to refrain from any increase in the spinning power until the year 1887. It was also proposed to form a syndicate for the sale of their products.

News comes from Berlin that the exports therefrom of finished cloths, especially the lighter classes for ladies' use, have been on the decline. Ten million marks, or half a million sterling, English, are said to have been sent less in 1885 than in 1884. The reason assigned there is that the English and Americans have made great strides in the competition with Berlin make, a fact which certainly ought to be noted, if only to encourage some of our countrymen, who are apt to think that the foreigner is getting it all his own way.

A correspondent of a foreign paper says that the shrinkage of paper used by draughtsmen may be overcome by a system which he has adopted for many years. All drawing paper is ruled with very faint lines to either one-quarter or one-fifth inch scale, and the drawings are made to correspond with these lines. Whatever the alteration in size or form of the paper, the variation in any square of one-quarter or one-fifth inch is a matter of no importance, and the drawing and scale both being on the same base, a ready and certain means of correction always exists.

Professor Hermann's apparatus, for determining the values of various lubricants for machinery, consists of a perfectly cylindrical shaft supported on two journals carried by a branched support, which so turns on a hinge, that the shafts can be adjusted at an angle of five to ten degrees to the horizon. The upper end of the shaft is rotated by means of a handle. To use the apparatus, a bent piece of the same metal, as that to which the lubricant is to be applied, is placed astride of the shaft and suitably weighted, and the number of turns of the handle requisite to cause it to slide along the shaft with various lubricants are noted. The greater the distance travelled for a given number of revolutions, the more efficient the lubricant.

The anticipated yield of the cotton crop in America is reckoned at about six and a-half million bales, far less than was at one time expected from a year which was, for several months, so unusually full of promise. There will be, however, a sensible advance in bulk upon that of last year. To show how closely results follow upon calculations, and in remarkable proof of the value of statistics to commerce, the Agricultural Department of the State, in February last, interpreted their returns to indicate a crop of 5,667,000 bales. The *Financial Chronicle* record of the market up to September following, aggregated 5,669,020 bales, and that of the National Cotton Exchange 5,706,163 bales. As 20,000 to 30,000 bales of the present crop were apparently included in this movement, the figures of last February may as well stand as the permanent record of the actual crop. These figures are taken from the December bulletin of the Department, and there could be no better testimony given to its splendid efficiency. When we come to Americanise our institutions, we hope that some means of giving such remarkable aid to trade and commerce may be organised on this side of the Atlantic.

The use of matches or open lamps for lighting up has been the cause of many fires about mills, says the *Boston Journal of Commerce*, and the device described below will be found to be applicable in many situations, and very convenient, as well as perfectly safe. It was brought to our notice by Curtis Doeg, engineer, of the Newmarket Manufacturing Company, Newmarket, N. H., who thus describes the apparatus as arranged in his engine room:—"I have a belt, which is twelve inches in width. To the box, in which this runs, I attach a coil about twenty feet in length, of steel wire. From this coil, I lead a brass wire about the room, keeping it insulated, and leading it within a few inches of each gas burner. The method pursued is to run the wire through screw-eyes, taking care that neither the wire nor the eyes come in contact with anything which would conduct the electricity away. I have a pair of hooks, made of brass or steel wire, with handles of wood or other non-conducting material, and connected by a piece of fine copper wire. When I wish to light a gas jet, I attach the smaller hook to the wire near that jet, and touch the jet with the other, which is bent so as to light a globe light, while it serves equally well for an open one. The electric current, passing from the wire through the hooks, jumps to the gas pipe to make a ground, making one of those sparks which may be seen by holding the fingers near a running belt, and, if the gas be turned on, this spark will light it."



### Receiving Orders.

Bold, T., Batley Carr, Dewsbury, Yorkshire, wool and waste merchant.  
Cockcroft, J., Roomfield Lane, Todmorden, Yorkshire, cotton and linen manufacturer.

### Adjudications of Bankruptcy.

Bower, H., Millhouse, Thurlstone, near Penistone, woollen cloth manufacturer.  
Page, F. (trading as Frank Page and Co.), 15, Carter Lane, London, linen collar and lace manufacturer.  
Williams, L. E., Norton Villa, Lampeter-Velfrey, woollen manufacturer.

### Dividends.

Green, T., 10, Shaddon Gate, Carlisle, cotton carder, draper, &c., 5s. 10d., Official Receiver's Office, 34, Fisher Street, Carlisle.  
Hall, H., Hall, O., and Hall, A. (trading as Thomas Hall's Sons), Providence Street, Batley, woollen manufacturers, 2s., Balm Mills, Liversedge.  
Hawkins, C. W., Adelphi Street, Preston, cotton spinner and manufacturer, 2s., 5, Winckley Street, Preston.

### Dissolutions of Partnership.

Cliffe, W. H., and A. T. Wilson, 2, Barker Gate, Nottingham, lace manufacturers.  
Dawson, R., and J. Sutcliffe, Salem Mills, Hebden Bridge, Yorkshire, fustian manufacturers.  
Darnley, C., and B. Fletcher, Crown Works, Princess Street, Huddersfield, Yorkshire, cotton, woollen, worsted, and silk card manufacturers.  
Hill, F. W., and J. Lumb, Bradford, Yorkshire, stuff manufacturers.  
Hirst, R., and W. Hirst, Turnbridge, Huddersfield, Yorkshire, cotton spinners and doublers.  
Marling, W. H., and J. T. Woolright, Stanley Mills, Stonehouse, Gloucestershire, woollen cloth manufacturers.  
Novelli, A. H., F. Koenig, and C. H. Bowker, Billiter House, Billiter Square, London, general merchants.  
Nichols, S. A., S. S. Nichols, and R. T. Nichols, Eanam Mill, Blackburn, cotton manufacturers.  
Paterson, J., J. R. Laing, and J. M. Bruce, 8, Australian Avenue, London, warehousemen and merchants.  
Wilson, J., and J. W. Barrett, 8, Cloth Hall Street, Huddersfield, wholesale woollen merchants.

### PATENTS.

#### Applications for Letters Patent.

Anti-ballooning thread guide for ring spinning machinery. J. H. Bower, Halifax. 16th Feb. 2,222  
Astrachan yarn. J. Howgate and Sons and F. Smith, Bradford. 19th Feb. 2,417  
Brushing machines for finishing blankets, &c. G. Thomas, Halifax. 5th Feb. 1,806  
Bleaching light and heavy textile fabrics, &c., by the Thompson and other analogous processes, which are applicable for dyeing processes. R. H. Ainsworth and E. B. Manly, London. 12th Feb. 2,051  
Belt pulleys. W. Pocock, London. 23rd Feb. 2,623  
Carding engines. J. Thompson and T. Barker, Manchester. 3rd Feb. 1,576  
Construction of chain slides and chain boxes of tentering and drying machines and apparatus for facilitating the passage of the selvage of pieces to the clips or gill-pins of such materials. F. Craven, Halifax. 11th Feb. 1,983  
Calenders, &c., through which successive lengths of cloth, &c., have to be passed. E. Marshall, Manchester. 16th Feb. 2,227  
Composition to be applied to straps, belts, &c., used with machinery, to prevent them slipping. E. B. Petrie and A. S. Fox, Manchester. 19th Feb. 2,460  
Combing machines. J. H. Whitehead and J. L. Kitson, London. 23rd Feb. 2,619  
Distributing oil or other liquids upon fibrous substances. A. Benn and P. Firth, Bradford. 6th Feb. 1,761  
Drawing off rollers of combing machines, gill boxes, &c. A. and W. Kendall, Halifax. 16th Feb. 2,220  
Drying machinery. W. A. Gibbs, London. 19th Feb. 2,464  
Extracting the fibres from fibrous plants. J. C. Mewburn, London. 29th Jan. 1,324  
Figured woven fabrics. E. and H. W. Makin, Manchester. 30th Jan. 1,355  
Feeding wool, &c. A. Haigh, Huddersfield. 5th Feb. 1,693  
Figured cloth and apparatus therefor. D. Boocock, Leeds. 10th Feb. 1,967  
Horse rugs or blankets. W. and J. Terry, Halifax. 30th Jan. 1,363  
Hearth rugs. F. Wilkinson, Halifax. 2nd Feb. 1,483

Jacquard card lacing machines. H. B. Payne and W. Campion, London. 30th Jan. 1,397  
Jacquard or figure weaving and production of cards and pattern surfaces therefor. A. G. Dawson and J. and F. E. Adams, London. 12th Feb. 2,091  
Knitting plyers for mechanical manufacturing of Smyrna carpets for knotting in of plush threads into the chain threads of a ground web made by machinery. B. Nebauer, London. 2nd Feb. 1,510  
Looms. W. Thompson and R. Heaps, Halifax. 29th Jan. 1,300  
Means and method for producing looped fabrics whilst weaving. A. Lister and W. Carter, Halifax. 2nd Feb. 1,485  
Manufacture of cloth termed "Lustrine de Soie." J. Burn, Bradford. 10th Feb. 1,928  
Metallic cloth. A. H. Thorn, London. 15th Feb. 2,204  
Metallizing woven textile fabrics. L. A. Groth, London. 17th Feb. 2,322  
Mats, rugs and other pile fabrics. W. P. O'Reilly, London. 23rd Feb. 2,621  
Operating drop-shuttle boxes and controlling the operation of the picking arms. E. Knowles and J. Houghton, Halifax. 11th Feb. 1,981  
Producing or forming designs on woven fabrics during the weaving. J. and A. E. Walker, Halifax. 30th Jan. 1,361  
Printing, tinting or colouring woven or knitted fabrics. G. H. Nussey, London. 30th Jan. 1,399  
Printing and discharging various colours on cotton fabrics dyed with a certain dye. F. A. and V. H. Gatty, Manchester. 3rd Feb. 1,577  
Pickers for looms. O. Ingham, London. 12th Feb. 2,031  
Pickers for looms. J. Kershaw and H. Hodgkinson, London. 17th Feb. 2,316  
Preparing wool, &c., to be combed. T. Redman, Bradford. 24th Feb. 2,667  
Reeds for looms. T. and T. E. Dean, Liverpool. 15th Feb. 2,197  
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Reels or frames for holding pile fabrics, &c. C. Longbottom, Bradford. 24th Feb. 2,695  
Rollers for preparing and spinning fibrous materials. W. Tatham, Manchester. 24th Feb. 2,699  
Spinning, doubling and preparation of textile materials. S. and T. Newton, Manchester. 3rd Feb. 1,561  
Scouring wool or other fibrous substances. J. Aimers, Galashiels. 4th Feb. 1,625  
Spinning, ring spinning and doubling frames. H. Ashworth and E. Eaves, London. 6th Feb. 1,770  
Spinning and doubling cotton on a ring frame. C. Butterworth, Oldham. 8th Feb. 1,810  
Spinning cotton, &c. J. W. Makant and P. Parkinson, London. 9th Feb. 1,843  
Stop-motion for twisting and winding machines. T. Unsworth and E. Whalley, Manchester. 12th Feb. 2,038  
Securing the ends of tapes employed for driving the spindles in spinning and twisting, &c. E. W. Hirst and J. Wood, Halifax. 13th Feb. 2,101  
Spinning machinery. W. Mair, Glasgow. 13th Feb. 2,105  
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Shuttles for preventing floats and faulty places in weaving. W. Worden and J. Booth, Halifax. 20th Feb. 2,484  
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Sizing yarn and finishing piece goods. R. T. Sutherland, Manchester. 24th Feb. 2,666  
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"Wweimal gedrukt" for printing designs of one or more colours, on both sides of the cloth at one operation, and to give exact fitting on cotton, cloth, silk, &c. P. B. Wilson, Glasgow. 4th Feb. 1,627

### Patents Sealed.

675	1,458	1,791	1,877	2,954	30	1,666	3,197
4,028	15,885	16,677	396	1,760	1,993	2,114	2,580
2,307	2,381	2,790	9,545	2,182	2,308	2,417	3,159
3,974	1,371	1,464	1,575	1,931	11,169	13,533	13,599
791	13,684	13,785	123	1,479	12,318		



# The Journal of Fabrics AND Textile Industries.

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## Notices.

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## The Lace Trade.

(By our Special Trade Commissioner).



THE lace trade has been in a very unsatisfactory condition for some time past, and considerable apprehension has been felt, by many persons interested in it, that future prospects are not as good as they ought to be, the great amount of foreign competition, to which this branch is now exposed, causing no small degree of uneasiness. The subject is one that calls for close examination under more aspects than may be commonly supposed, there being some very unusual features in connection with it. Embroidered Edelweis laces are in request for millinery purposes, a good many of which are imported into this country from abroad, the demand for Nottingham goods also having of late improved; but a new feature in this branch is that much of the plain net is now being sent from thence to the continent to be worked, payment being made for the embroidery only, which the local manufacturers sell as home productions, and which are also shipped as Nottingham goods—a system which is, of course,

greatly adverse to the fancy lace machine holders. An improved demand has sprung up lately for Maltese laces in white, cream, and ecru, while certain varieties of Torchon lace are still saleable in a few leading colours, with Irish crochet edgings, and laces with fast-coloured red threads, which find a sale thus for trimming purposes—the Turkey red contrasting prettily with the white ground. The demand for silk Spanish and guipure laces has somewhat improved of late; while light muslin, or *lisse* laces, are beginning to make a move; large quantities of the latter being sent from abroad. An improvement has also recently taken place in the curtain branch, but the productive power of this division is so great—as goods may be literally turned out by the acre—that any continuous demand would be immediately met with an increased rate of production. Tattings, crochets, and American descriptions, are limited in their sale, while the thick embroidery kinds, which have been a great feature in the Nottingham lace trade of late years, though recently dull, are improving in demand. The bobbin-net trade, which has been fairly prosperous for some time past, except in coarse numbers (nets above nine-point gauge being mostly in demand), is, however, greatly exceeded by the supply, though patent spotted nets occupy a somewhat healthier position; while in the made-up branches, such as ruches, frillings, and fancy goods, fichus, imitation Shetland squares, scarfs, &c., the returns made are much smaller than they have been. Such are the leading features of the main divisions of the lace trade at the present moment, none of which are satisfactory; and it is pretty clear to experienced people that something fresh is needed in this direction to “waken up the trade,” and to produce an alteration for the better in this line of production; but the question is—in what channels should these be made? which, although it may not be possible to answer in a categorical or direct manner, may be replied to indirectly from analogous experience in the past, and from a knowledge of the existing condition of the market, and its possible requirements in the present, which we will briefly lay before our readers. About seven or eight years ago, the Nottingham lace trade was in much the same condition as it is at present, though the circumstances were far different, the assortment of goods in it being much smaller, and there being comparatively little foreign competition to contend with. Yak lace had been introduced, which, being a hand-made article produced by children and ill-paid women abroad, came out at low prices in the coarse and open classes that are most familiarly known, and which were largely sold as trimmings, in black almost exclusively; but foreign competition in machine-made lace was almost unknown as a formidable element, although a small English trade had always been done by the St. Pierre-les-Calais makers. Even old Nottingham lace machines, which had been superseded by later improvements, could be sold occasionally to France and Germany for considerable sums; but foreigners now, instead of buying English machinery to any extent, make it for themselves at much lower rates than they can purchase it in this country, and the large profits made in recent years by some of the Calais makers, in which they doubled their capital in a single year, resulted in so much over-production and general inflation, as to cause the collapse which has lately been experienced there, and through which large quantities of goods have been thrown upon the market, and jobbed; an incident which will throw no small degree of light upon present foreign competition, in connection with that arising from considerable imports of German-Swiss goods, which forms a new element since the time to which we are directing attention, namely, seven or eight years ago. Then, the ordinary fine description of cotton laces made upon Lever's machines had decreased in demand. Blonde edgings and laces, which, in some previous years, had always sold to a considerable extent, were out of date, Spanish and other laces of an analogous description were not called for; little was doing in imitation Valenciennes, and the trade altogether was in a very unsatisfactory position. This was, to a great extent, remedied by the introduction of the imitation embroidery goods in thick classes of cotton laces, Hamburg nets, and the coarse-looking open lace of the Torchon order, which figured under various names that suggested themselves to makers, who brought out something different from time to time, as antique, &c. The Hamburg nets and the imitation embroidery trimmings were originally suggested by Swiss piece embroidery in Tussore, or Holland



cloth, which, it occurred to the first who essayed the attempt, might be made in imitation upon the Nottingham lace frame; but, in the first place, there was a great difficulty in getting coarse-guaged machines on which to make them, as they were comparatively scarce, yet to the inauguration of this description of production is due no little share of the business in lace goods that has been transacted in recent years. The inference is plain. Something fresh is needed, and of a character different from the ordinary lines of production so familiar to all, and, that this can be done, past experience fully demonstrates. We have incidentally alluded to the imitation Shetland branch. The origin of this was mainly due to the efforts of one firm, who took great pains with it, introducing the coloured borders, and the salient features of good and elaborate patterns. The trade grew quickly, and found welcome work for numerous old hands that had been doomed to enforced idleness, through lace hosiery having gone out of fashion, and this branch gave employment to the outlying districts of Nottingham, such as Hucknall, Torkard, Sutton-in-Ashfield, and other places. In eight-quarter squares, the New York buyers found them very successful in the Southern markets, but in the home trade, this branch, in the shawl size, has been mainly supplanted by German goods of a slacker-spun and coarser wool, though light in weight; the great attraction of these being the fringes; which are of a highly ornamental description, this being a strong feature with the Germans, but a weak one with Nottingham manufacturers. Fancy trades often attain very large proportions from very modest beginnings, and it is now necessary that fresh attempts be made in the Nottingham branch by those interested in it. The public are always willing to take up a new thing; indeed, the universal complaint is that fashions now change with such rapidity, so that there is no keeping pace with them on the part of producers. Very little has ever been done by Nottingham makers in the direction of aiming at dress fabrics. There is always a certain amount of gauzy and thin materials sold every summer, and we should consider there was a good opening in this direction, for the dress trade is a very large one. We know of one difficulty that may be urged against this, viz.—the liability of a wide material to show defects, and the inevitable “mending”; yet, as fashion prevails just now, where wide goods are cut up and worn as adjuncts with others, there are many materials which could be produced in Nottingham, that could be thus employed. Some time back, we were shown some extremely nice goods in trimmings, which, pretty as they were, had done no good for themselves, probably on account of not being properly put before the trade; they consisted of raised stripes, like velvet, the effect of which was very elegant; and we venture to affirm that such a material in the wide width—the usual dress width, about 27 inches—would be eminently successful in the hands of the costume maker, for cutting up, and blending with other materials, as is now commonly done. Out of such fabrics also could be made small capes and goods of the fichu order; a species of production that the present class of shape in vogue would seem to favour, being short behind with long fronts, a style favourable for the adoption of this kind of article. Unfortunately, with most manufacturers, the knowledge of the applicability, or fitness, of certain articles for certain purposes, does not extend outside the scope of their own immediate course of production; and it is left too much to others to suggest the usefulness of particular goods to certain adaptations; and to this must be added the difficulty of introducing new goods into the trade when they are designed, for, although, as said before, the public are willing enough to take up fresh things, buyers in the wholesale cannot be induced to try every new thing that is shown to them, for even they have not, in most instances, the experience of the retail draper, who can pronounce, in a moment, whether an article is one that may be called of a “merchantable” description or not. But that more could be done in Nottingham, than is done, in bringing out, or originating, new things is unmistakable. A large trade is frequently done in foreign fringes of various sorts that are sent to us from abroad. One description, of which a large quantity has been sold, consisted of narrow strips, that were crimped, inserted in a suitable heading. These strips could be formed in various ways, there being no absolute or specific requisition of what they should consist, and many things might be converted to this use, as patterns of the river

order. The cutting of these into strips, by which operation a little ragged edge would be left on either side, would be no detriment, but rather a recommendation in such an article as fringe, as it would appear to be an extra finish, or to form part of the pattern. Possibly, crimping machines, of the kind used in crimping silk fringe, may be scarce, or nearly unknown, in Nottingham, but they are to be bought cheaply enough, and can often be used for little things without heat, but if heat is required, it can be supplied by small gas jets, that are easily and cheaply affixed in factories; and a few parcels of a new thing, sold at a good profit, would soon pay the extra expense incurred in supplying them. The writer upon such subjects can merely indicate, in a general way, the direction in which efforts should be made, from knowledge gained by experience in the market; but it must be left to individuals themselves to exert their ingenuity and inventive powers to inaugurate the precise form that these trials should assume. As before remarked, there is plenty of room for fresh things—indeed the trade is asking for them, especially in curtains. A very little change often provokes fresh interest in any given department; and this happened a year or two back, when people, tired of the Nottingham lace curtain (elaborate and beautiful as the designs often were), hailed with welcome, ecru-coloured curtains, or white and ecru mixed, which sufficed as a novelty for some time; and probably something original in style, of a plain description after the stripe order—as a broad tape stripe—for the body of the curtain, with an elaborate patterned border, might be found to take with the public; but our suggestions must be received as being thrown off more in a general sense, to illustrate the subject, than as being recommended for absolute adoption, according to the precise lines indicated; for it must be left to individual skill and ingenuity to make fresh departures in the proper direction, which, we venture to think, might often be done to great advantage.

### Cost of Operating a Mill in America and Scotland.

Messrs. Finlayson, Bousfield and Co., flax manufacturers, of Johnstone, Scotland, have works in the United States also, and the following extracts, from the reply of their American representatives to the circular of secretary Manning, are interesting and instructive as to the effects of the protective policy:—“The wages paid throughout all the manufacturing departments at Grafton, U.S.A., are fully double what are paid at the Johnstone Mills for exactly the same work. In many cases, the Grafton rates are 200 per cent. greater; and it is certainly within the mark to state that the wages at Grafton are double those paid in Johnstone for the same work and time. The machinery at Grafton was all imported, as no flax machinery, such as is there used, is, to our knowledge, made in the United States. The duty on the machinery (iron) was 35 per cent., and on the brass and steel portions 45 per cent. ad valorem. With transit and other incidental charges added, the cost at Grafton was 50 per cent. higher than in Scotland. Such experience, as we have had of building in the United States, leads to the conclusion that a mill here costs at least double what the same mill would cost in Scotland. With buildings and machinery costing 100 per cent. higher, it will be seen that a mill in the United States, fully equipped for running, will involve double the capital and interest charges of an establishment in Scotland. General mill supplies are, as a rule, dearer at Grafton than at Johnstone, although oils are somewhat less here; but, on the whole, prices at Grafton for supplies are higher than in Scotland. Coal is a very important item, and it is considerably dearer at Grafton than at Johnstone. Coal has never been lower at Grafton than \$4.50 per ton, while at Johnstone a similar quality could be bought for \$1.25 to \$1.50 per ton. The cost of coal at Grafton, therefore, will be fully three times the cost at Johnstone. From the foregoing, it will be seen that the cost of manufacturing threads at Grafton is very much greater than in Scotland—(1) the duty of 5 to 7 per cent. on the raw material used; (2) building costs 100 per cent. more; (3) machinery costs 50 per cent. more; (4) coal costs 200 per cent. more; (5) wages are at least 100 per cent. higher. Under such circumstances, a protective tariff is absolutely essential to the existence of an American thread mill.”





### Commercial Morality.

**D**URING the last few years, much has been said and written upon one and another of the different phases of commercial morality, or, rather, commercial immorality. We are not aware, however, that any very great prominence or publicity has been given to the custom of "tipping" the servants of spinners and manufacturers. This custom is prevalent, in some districts, to a very great extent, and is the source of considerable loss to the mill owner. What good men of business usually endeavour to do is to purchase the best goods, *i.e.*, such as answer their purpose best, at the lowest possible cost. How, indeed, can this be done, when those, upon whom they must, more or less, rely, are bribed? It is like keeping a watch dog, and then having him drugged. It is not our purpose to more than mention, in passing, the employment of a cigar, or a glass of some thing, in order to secure an order, which may have been trembling in the balance, though this is sometimes carried to a most unsatisfactory extreme. We have known of cases, where orders could not be obtained unless one was prepared to thus treat the man who had them to place, and, if the tales we hear are true, this even extends to the highest officials in the service of the country, where good dinners and champagne often secure a pending order. The kind of "treating," of which we purpose speaking, is that which is largely followed by those in certain businesses, *viz.*—the custom of giving money, or a certain percentage to the man—often not to the giver of the order—whose duty it is to inspect the goods when delivered, to report upon their quality, and, very often, to use or to work them. Whether this is fixed at so much on the value of the goods supplied, or whether it is so much per ton, per gallon, or per dozen, this custom is equally a robbing, and entails considerable loss upon the purchaser. The vendors of engine coal, oil, chemicals, and roller leather, would seem to be the chief sinners in this respect, so far as the cotton trade is concerned. Cases of this sort have been, in time past, notorious in the calico printing trade, and more has not been heard of it in the cotton spinning and manufacturing branches, because, when the trade was profitable, many mill owners, rather than have a bother, preferred to be thus robbed, so long as the robbery did not prevent a handsome balance to the credit of profit and loss at the end of each half year. As, however, it has become almost a fight for existence, when £100, or even £50, is a matter of no little consideration, this system of "treating" is becoming of importance. In some districts, the custom obtains of sending certain employees, at the different mills, presents of turkeys, geese, or spirits. This custom, although not as detrimental to the interests of the employer as the percentage system, yet, by increasing the cost of distribution, eventually takes money out of the pocket of the purchaser. He, in effect, has to pay for these presents to his own employees, whom he already pays for their services. This system has its dangers. A case came under our observation lately. A spinner had supplied a certain firm with warp yarn for upwards of six months, and the yarn had given the utmost satisfaction. On New Year's day, the weaving manager's son called at the mill, and asked for a Christmas box. He was informed that it was not their custom to give Christmas boxes. Mark the result. The spinner never obtained another order. No complaints were made, only no orders were to be had. But, when a commission is paid to servants upon orders given, not only does the master have to pay indirectly that commission, but the chances are that he will often have to pay a price more than the actual value, plus the commission; so that, whilst he indirectly pays to his own servant a commission of, say, 3 per cent., he may be a loser to the extent of 10, or even of 15 per cent. It may be taken for granted that no man would thus seek to corrupt the servant, unless he desired to sell his goods at more than they

were actually worth. To show clearly what we mean, we will instance a case in the coal trade. At a town we could mention, it has been the custom, for many years back, for the coal proprietors to pay a bonus of 1d. per ton to the firemen employed at the mills they supply with fuel. A certain firm commenced business there, and gave the firemen a bonus of 1½d. per ton. Although they supplied a slightly inferior coal to most of the other firms, yet, in a very short time, they did a large trade at some mills; the coal, which had given satisfaction for years back, was suddenly found not to do at all—the steam could not be kept up—and, in fact, the coal had all the bad faults engine coal can have. The worse coal at 1½d. per ton bonus answered, of course, perfectly. The concerns that paid only the 1d. bonus kept looking up their old customers, and, in one case, had word sent them, by the fireman, that if they were to send house coal, it would not be good enough. It may be objected that the use of indifferent coal can easily be detected by the quantity consumed weekly. This, however, is not so readily done as it would appear, providing the engineer and fireman are in collusion. Slightly better coal, indifferently fired, will not go so far as coal a trifle worse, and carefully fired, and it is not possible for the owner to be in the fire hole the whole day through. The engines may for a time be tampered with, and other things may be done which are not so easily found out. The first step is generally to get the coal, which the man desires to cease to burn, into discredit, and this done, he experiences little difficulty in getting the high bonus coal tried. Plenty of excuses may be found for an increased coal consumption, and it may be a long time before even the employer, who looks most carefully after every detail of his business, finds out the real reason. In the oil trade, this system of bonuses obtains in some quarters to a large extent. There are oil merchants who have such a reputation for doing this kind of business, that some *knowing* purchasers will not permit them to enter their premises, and would not, on any account, give them an order. Many are the concerns where no oil, except that supplied by one merchant, is ever satisfactory—all others, sooner or later, are found to be wrong. The same merchant's oil has been purchased, and then sent to the firm by another person, and yet, strange to say, it would not do. In some cases, where the oil merchant has been more enterprising than usual, and has followed the matter up, he has found that water or other deleterious matter has been mixed with the oil. These facts, and facts they are, speak for themselves. In our experience, there are numbers of firms who sell oils which will lubricate machinery satisfactorily, but the employees, upon whose opinion the employer so foolishly relies, have not the necessary knowledge to form any opinion of their comparative value. At the present time, it is a question of judgement, as to the value obtained for money, and such important factors as the flash points—all subjects about which the men, to whom we refer, know nothing at all. The dealers in roller skins, in some districts, pay a bonus of 1s. per dozen to the roller coverer upon all the skins he uses. This is about three per cent. upon the value of the skins. There can be not the least doubt that this bonus enables the dealer to have skins passed which could only be used to the detriment of the concern. It is an old saying—that "no man can serve two masters." Interests cannot be divided, without one or the other suffering. It is the duty of a servant to use as little coal, oil, or as few roller skins as he can, whilst the seller of these goods changes all this, and, by the bonus system, makes it the personal interest of the servant to use as much, or as many, as he dare. At all times, it is a matter of no small difficulty to make servants as careful as they should be. How greatly then must this difficulty be increased, when things are so arranged that it is made their personal interest not to be careful. It is evident, therefore, that the employer not only pays the bonus given to his servant, but also suffers, to even a greater extent, by an increased consumption, and, perhaps, by a price enhanced over and above the bonus given. We have no hesitation in saying that many firms suffer to the extent of from 10 to 15 per cent. from this cause. Were roller skins always examined by the proprietor upon their delivery, and all skins not suitable, or up to the mark, rejected, the dealers would not find it so much to their interest to propitiate the roller coverer. The time has gone by when lubricating oils, their properties and value, were only thoroughly understood by a few. Those, who are not conversant with their merits and demerits, can, with little trouble



and expense, become so. They can also get the oils they use tested for them, should they be unable to test them themselves. There is, then, no reason why they should continue to be led by the nose, and robbed by unprincipled dealers and unfaithful servants. The bonus system in oils, therefore, should shortly become a thing of the past. In coals, however, until such times as the mechanical stokers are so perfected that they will be used universally, something should be done to put an end to the abominable system. Why should not the mill owners, in any town or district, decide that they will only buy engine fuel from those coal proprietors and dealers who will sign an undertaking, with penalties for breaking it, that they will discontinue giving such bonuses? Most of these gentlemen, we feel sure, would not object to signing such an undertaking, and those that did object would brand themselves for ever. The first breaking the undertaking should, of course, be prosecuted, and the penalty—named in the undertaking—should be large enough to cover the expenses of the prosecution. The other sellers of coal would, of course, for their own interest, help the mill owners to detect any defaulters. We throw out this suggestion to the trade.

### Remarks on Fashionable Fabrics.

Merchants of nearly all classes of textile fabrics are continually asking manufacturers for something absolutely new in material, design, and in combinations of colouring; for something that will take the taste of the public generally. One would have thought that the many changes that have been made, during the past few years, in materials and their different combinations, and the endless varieties of improved fabrics that have been put upon the markets, ought to have fully satisfied all classes of wearers. If the patterns of any description of fabric in fashion twenty years ago were placed side by side with samples of those now worn, the wearer would be much astonished at the superior materials in use at the present time. The rapid advances made in every department of textiles, during the time above named, have been something wonderful. Into whatever branch we look, the enormous development is almost incredible, and surprises even manufacturers themselves; but still the cry is made for something absolutely new, and merchants are urgent respecting the want. What form new fabrics should take, they are unable to say, having no suggestions whatever to make, and, consequently, the work must naturally fall upon the manufacturer. What the producers of fancy goods of various kinds have done, during the present generation, in producing new fabrics, merchants evidently expect them to continue, and, consequently, certain firms are always experimenting and placing the results of their endeavours on the market, but still the want is felt for some fabric distinctly different to any yet manufactured. If we take, for instance, the worsted and woollen cloth trades; twenty years ago, the materials made had a great degree of sameness about them; fancy tweeds, chevots, and such like goods, were meagre in point of design and colouring, although at that time there were many effective fabrics, but, during the past few years, there has been a marked contrast in this respect. Manufacturers have vied with each other in producing these cloths as effective, almost in every respect, as it is possible to make them. But still the tweeds and chevots of to-day are in many ways similar to those of former days, although there have been, what may be described as, changes rung upon them. Perhaps, in the worsted branches, the most rapid strides have been made in the old doeskin cloth, now so little worn, and which has given way to the worsted coating and trousering; a material that must be said to have been an absolutely new make of cloth. When first introduced, these worsteds, compared with the productions of the present, were far from brilliant specimens of manufacture, but they gradually gained a hold upon the public, and now it is a rarity to see a garment of broad black cloth upon the backs of the younger portion of our population. The worsted coating, when the manufacture was firmly established, made rapid progress, and now holds the first rank among materials for gentlemen's wear, but there are continual inquiries for something entirely novel to supersede it, and it is for manufacturers to find this much sought for cloth. In the dress-goods trade also, the same cry is heard from time to time, and, although, during the past two or three years, what may be described as a new fabric has had a fair run (we refer to the curled, knotted,

and such like goods), still something quite different in material is now required. In the Lancashire cotton districts, the same change is constantly desired, and also in the silk trades. What forms these new fabrics will assume is beyond us to say, but they must be something which, in combination of material, design, colouring, finish, and general "get up," must be very striking, and the manufacturers who are first in the field with the new ideas, will, we presume, reap a benefit. In the manufacture of dress fabrics great developments will have to be made to suit the tastes of buyers. Makers of these materials, ere now, have had the mortification of seeing the ground literally cut from under their feet by foreign competitors. This has been more particularly the case with the firms in and around Bradford, who, as has before been often stated, notwithstanding repeated warnings from those well versed in the requirements of the times, still held on in their old course, until stagnation of trade compelled them to open their—until then—very deaf ears. But at that particular period, the opening came too late to avert misfortune, for they found, greatly to their cost, that manufacturers cannot force any particular standard, make, or style, upon purchasers, but that the only way is to keep abreast, or, if possible, just a little ahead of the times. We, therefore, hope that producers generally, and those above mentioned in particular, will be fully alive to the go ahead pace exhibited in the taste of those upon whom they are in reality dependent, namely, the wearers of dress goods. Why we, as a manufacturing nation, should look to the French for evidences of taste and style in wearing apparel, is, perhaps, a little peculiar. The custom of the leaders of fashion causes this, in a great measure, to be so. But there must, first of all, have been a reason for this, and we do not think it requires one to look far for it. French manufacturers are always alive to the necessity of producing taking novelties, and this being so, although they have the risk and expense which this entails, they must inevitably gain by having "the first pull" upon the market. Patterns of their fabrics come over here, and there is a desire, on the part of our manufacturers, to imitate them, and this, at a time when the market is probably stocked with the goods of their foreign rivals. Now, if they, in all branches, would launch out more in the direction of novelty, the custom of following the French would, in the long run, be a thing of the past. As we have stated before in these pages, the craving is for change, and those who pander to this craving will be the ones to benefit by it. We have recently seen some very elegant foreign novelties in dress goods, which one or two of the leading London houses have brought before the public, and some commoner modifications of the same thing are also to be seen. We refer to bordered dress fabrics, which are specimens of elegance, consisting as they do, of charming designs and tasteful colourings. A piece of the material is woven quite plain (soft, all-wool fabric of the nun's veiling order), and the bordering is produced in a separate piece, that it may be cut, as desired, to trim the plain material. Some of the styles we have seen have quite bold designs upon them, but these are tempered with a soft effect of colour, which renders them beautiful in appearance, when, otherwise, they would be, at the best, but abortions. As indicating the class of pattern employed, we give on our second plate a design for a border, which will be found described under the usual heading on page 42. We suggest to our Lancashire friends the advisability of adopting this style in the printing of their dress goods for the coming year, as they cannot fail to secure a ready sale. Another very pretty dress fabric is that called the "tapestry robe." The drapery is again woven in a separate piece (all-wool fabric), as also is the trimming material, which consists of small diaper work, or an all-over small floral design, in raised loops (like the Turkish towel, but so small as to be scarcely recognisable as loops), upon a dull, or bright, ground of fashionable shades of colour,—four or five colours being employed in the production of the patterns. These are very handsome, and are likely to gain much favour with wearers. This fashion, also, may, with safety, be followed by our Lancashire subscribers. We see a similar cotton dress material, in stripes, but not in flowers. Before leaving this subject, it may be well to mention, for the benefit of manufacturers of mantle cloths, that, at present, merchants are making demands for the Ottoman and Soleil descriptions of production—we therefore, for the interest of our new Subscribers, repeat the designs and particulars given in January and February issues (1885).





### The Royal Commission on Trade.

**S**IR JOSEPH C. LEE (Messrs. Tootal, Broadhurst, Lee and Co.), in his evidence before the Royal Commission on the Depression of Trade, gave some interesting information with regard to the staple industry of the country. Sir Joseph said he had made a careful inquiry with the object of arriving at the various grades of skill which exist in every hundred of the working population. The first grade, he described as first-class skilled labour, and this he put down at 10 per cent. Second-class skilled labour, he put down at 15 per cent., and third-class, at 25 per cent. The fourth grade was unskilled labour, which he put down at 40 per cent.; and in a fifth grade, he classed all "useless people" together, 10 per cent. In his opinion, the tendency of trade combinations was to increase the supply of third-class labour, at the expense of first and second class labour. Such combinations, in fact, really stereotyped labour, and were the cause of a decrease of first-class workers. He believed that there was no lack of employment for workers of the first and second classes; but, when producers were slack, the weeding-out process began in the lower classes. Production, the witness stated, was no longer the question of the day. We can produce, in manufactured articles, more than we can distribute. Distribution is the question which should occupy the attention of merchants and economists. There is an excess of manufacture in all sorts of yarns and fabrics easy of production. This, in a great measure, he believed to be attributable to the Limited Liability Act. The object of the limited liability companies is to get off quantity, regardless of quality. The latter was only a secondary consideration. The supply of the lower class of yarns being too great, consequently, prices are unremunerative. Being asked to state the difference in cost of manufacture of various fabrics, in order to show the advantage to the country of skilled labour, he said—Cotton at 5d. per lb. is sold in yarn at from 7½d. to 8½d. per lb., and in cloth at 1s. per lb., leaving a margin of only 7d. per lb. for expenses, profits, &c. There is another class in which the cotton costs 5d. per lb., the yarn 9½d., and the cloth 1s. 2d., the margin being 9d. per lb. In a third-class, the cotton costs 6d. per lb., the yarn 1s., cloth 1s. 6d., with a margin of 1s. In still another class, the cotton costs 6d. per lb., the yarn 1s. 6d., the cloth 2s. 4d., and the margin is 1s. 10d. per lb. From this, it would be seen that the greater the skill and diversity shown in production, the greater is the margin secured for wages and expenses, and the greater the profit left in the country. An idea seemed to prevail that quantity pays. In the long run, in his opinion, that was not so. He thought that English manufacturers ought to give more attention to quality. Some of the highest skilled fabrics used in this country, we do not make ourselves, because we have not got, nor can we easily get, the skilled hands. One great barrier in the way of distribution is our want of commercial law. There is no code; only "judge-made" law—law established on precedent. The decision of the Master of the Rolls, in the great case of *Williamson v. Barbour*, destroyed the commission houses of Manchester and elsewhere. Those houses were the great distributors of English productions throughout the world. Formerly, adequate information was to be obtained from the commission agent, who was accustomed to bring together the foreign buyer and the manufacturer, and thus the practical producer became acquainted with the requirements of the distant markets. The agent has now become a merchant, and sells his goods to a foreigner, and being no longer a go-between in the matter of buyer and seller, keeps his customers to himself, and the producer loses the advantage of the intercourse which he formerly enjoyed. Trade customs, that had been recognised for a century, were finally upset by a single judgement. The Judge declared that "even if you can prove that such customs exist, I would not recognise them." Sir Joseph

Lee was questioned with regard to the calico-printing trade. He stated his belief that the output per month of the machinery of this country at full time was about 70 million yards. There had been no reduction in wages during the present depression. The existing stagnation was to be attributed to various causes—to fashion in Europe, to exchange in western markets, where there was a fall in the value of produce. In the extreme East, the trade in prints was generally good. Being asked as to the establishment of the British Alizarine Company, Limited, he said:—Alizarine was the "staff of life" to a turkey red dyer and calico printer. The manufacture of alizarine had been a German monopoly, but the British company had put an end to this monopoly, and the trade was no longer dependent upon foreign caprice. Alizarine was now made in this country as good and cheaper than the imported article. With regard to limited liability companies, the witness expressed his opinion that their competition with private firms was unfair. Many limited liability companies in the Lancashire district had all their share capital paid up, and had no money left with which to work their business, except what was borrowed on debenture, or what was called "loan money." Several companies had been established on this plan, the want of working capital shortly necessitating a loan. Interested parties took up the loan, and the money was turned into shares bearing 10 per cent. interest, the shares ranking for profit after interest was paid. Some questions were put on the subject of labour. The witness said he knew a firm which usually employed 3,000 persons in dyeing, but who had discharged 1,000 hands, mostly belonging to the unskilled class. The cause of the bad trade existing was that a great deal of goods were now shipped in the grey state, as the various *ad valorem* tariffs favoured that practice. He believed that a large number of people, belonging to what he had denominated as the fourth class of workers, were always within a measurable distance of starvation. With reference to trades' unions, though he did not pretend to speak with authority, he thought their influence on the trade of the country was bad. They were very different from the old English guilds, which recognised the various grades of labour. What the trades' union did was to place all men on the same level, so that no one, except the more ambitious, had any inducement to become a skilled workman. On the subject of tariffs, Sir Joseph Lee said he was not in favour of any impost on foreign manufactures, nor did he think the scheme of removing local taxation from the English manufacturers, by placing the burden on foreign merchants, at all feasible. He was against a system of *ad valorem* duties. To the honest manufacturer, specific duties were preferable. He described the system which prevailed in the United States, and said that English manufacturers, who made an honest declaration of the value of their goods, were placed at a great disadvantage in comparison with French and German traders, who systematically undervalued their productions. In one year, the undervaluation by the latter, on one class of goods alone, was estimated at \$2,500,000. He had given what assistance he could to the United States Treasury, who desired to put a stop to this state of things. Mr. Marshall Field, a well known American merchant, stated, some time ago before the United States Textile commission, that the systematic undervaluations of goods by foreign traders were destroying legitimate commerce in America. In dealing with the French Customs, a great many difficulties were placed in our way. Every shipment of goods was subjected to rigorous examination, not for the purpose of discovering false declarations, but to delay and to discourage English traders. He was not aware of any remedy for this. The English Government might retaliate by behaving in the same way, but though that might have the desired effect, he would not say he was in favour of such a course. In Spain, there was no doubt a good deal of smuggling went on. The Spaniards themselves would be the gainers by a reasonable and liberal tariff being established. The witness recommended the establishment of tribunals of commerce, by which commercial cases would be settled in a way juster, cheaper, and more advantageous to trade than was now possible. He expressed himself in favour of trade charters.

We beg to inform our readers that the continuation of the Article on the "Proell Automatic Expansion Gear" is unavoidably held over until the next month's issue of the Journal.





It has been our custom, in the past, to issue designs suitable for some specially named kind of fabric or fabrics, but we depart this month from our usual habit, and give, on our first plate, a very beautiful piece of Ornamentation from which our subscribers may gather some valuable ideas. The pattern is from the well-known pencil of Mr. George Lees of Kidderminster.

Our second plate presents a design for a Bordering for All-Wool Dress Goods, to which allusion is made in the article on "Remarks on Fashionable Fabrics." The pattern may be woven vertically or horizontally, and should be produced in subdued colourings, harmoniously blended. For instance, on a ficele ground, the pattern might be woven in crimson, blue, and gold; on a navy blue ground,—in bronze green, maroon and gold; on a brown ground—in olive, brick and gold. The design is intended to be repeated, a sufficient width of plain material must be left between each repeat, six inches at least being necessary to render the style pleasing.

The third plate contains a design for a Silk Hanging. It would be effective produced with dark gold figure, tipped and shaded with light red and light blue, on a ground of sage green. This pleasing pattern is the work of Mr. F. Layton, of York Terrace, Akroydon, Halifax.



**Wool.**—The second series of Colonial wool sales commenced on the 22nd of last month, and, up to the present, the home trade has operated rather freely, whilst the Continental buyers have only taken a moderate quantity of wool. The class of wools for sale has been above the average in quality, and prices, on the whole, have kept moderately firm. In the Yorkshire districts, the demand for English grown wools has ruled steady, at firm rates, with the exception, perhaps, of the finer descriptions, which have been rather unsettled. Skin wools have been sold freely, as produced. Yarns have not met any improved demand, orders having come in slowly, and for small quantities. Prices have had a weakening tendency. The piece branch has fallen off both for home and foreign account, and new orders have been scarce. The export of coatings and linings to America has been checked slightly. In Scotland, a fair business has been passing, and prices for most classes have kept tolerably firm.

**Cotton.**—The markets, towards the end of the month, assumed rather a quieter aspect. The turnover during the month, probably, did not exceed the production, either in yarns or in cloth. In the East Lancashire manufacturing districts, production may now be said to have attained its normal level. Very few mills are stopped, and we hear of new ones being projected, chiefly for looms. Perhaps this is to be regretted, but under the circumstances it is practically unavoidable. The better state of affairs has been brought about by the wise and prudent resolution of manufacturers, during the past year, to stop their looms whenever orders could not be secured that would return the cost of production. The inquiry for yarns, owing to the starting of the recently stopped machinery, has been appreciably greater, and so far enables spinners to keep moderately steady in their quotations. Though there has been a tendency to ease off from the excitement of last week, there are still to be found many who adhere firmly to rates  $\frac{1}{2}$ d. to  $\frac{3}{4}$ d. above those lately current. In other cases, buyers can purchase at very near the old level, but these are mostly yarns that have not a high standing in the market. The inquiry for cloth has been very quiet. Manufacturers still continue moderately well sold, and,

of course, buyers are correspondingly well bought. Neither, therefore, are very anxious for increasing their responsibilities under present conditions. Blackburn goods for India are fairly well under contract, and are steady in price. Burnley printing cloths are quiet, with a tendency towards ease; the better makes of South Lancashire and Cheshire are in less request, and show no signs of early improvement. The heavier makes of cloth are rather weaker than of late, and can be obtained, in most instances, at slightly easier rates.

**Woollen.**—The earlier part of the month witnessed a quiet trade, in nearly every department, as far as buying was concerned, but with the advent of milder weather, towards the end of the month, more life was put into the business. Exporters to America have operated more freely, and there have been signs of some improvement in the export trade to two or three other countries. The better classes of worsted, of good design and colouring, met with most favour, and manufacturers of these fabrics keep fairly employed. The medium classes of goods do not as yet sell freely, and are consequently affected in price. The lower qualities, especially, for the ready made clothing trade, have still a fair run, although every sample has now to be produced at a meagre profit. In nearly all districts, looms that are on fancy cloths keep fairly busy, whilst in plain goods, many are only either partially engaged or at a stand still.

**Linen.**—Although many manufacturers keep fairly employed on orders, the trade, on the whole, has been quiet in most branches, and there seems no prospect of an immediate improvement. The demand for export has been better than that for home consumption. Prices still are very low and unremunerative. There has been a slight improvement in the jute branches, with a steadiness in rates. The flax and tow markets have shown no perceptible change during the month.

**Lace.**—A slightly better and more hopeful feeling has pervaded the different branches of the lace trade, and the actual business done has been larger than for some time past; this may possibly have resulted from the more genial weather, which came towards the end of the month. The demand for the various classes of embroidery goods has been better, and the same may be said of Brabant, Chantilly and such like laces. Fancy hosiery has also met an improved demand. The curtain branch still keeps rather unsatisfactory, although some really admirable productions are put upon the markets.

### Trade Returns.

In reply to the resolution passed at the annual meeting of the Associated Chambers of Commerce on this subject, the following letter has been received from the Board of Trade:—I am directed by the Board of Trade to acknowledge the receipt of your letter of 1st inst., transmitting copies of certain resolutions relating to the subjects of trade statistics and bankruptcy which were passed at the annual meeting of the Association of Chambers of Commerce, and to inform you that the resolutions referred to shall receive full consideration. With regard to that part of the resolution respecting trade returns which states that the Association are of opinion that the utility of those returns 'would be much increased by an improved classification of articles, and the information as to the ultimate destination of exports,' I am directed to state that the Board of Trade are at all times anxious to make these returns as complete and as useful to the trading classes as circumstances will permit, and that they will be glad to receive any suggestions, which the Council of your Association may have to make with regard to this object, in the direction of either of the points indicated in the resolution."

The patterns (page 43) are given as specimens of leading styles in fabrics for the Spring and Summer of 1887. Merchants are making enquiries for Ottoman and Soleil Mantle Cloths, and, therefore, we reproduce, from a former issue, four patterns for these materials. We are led to do this as we know that no better designs could be produced. We may add that, we have seen, as is generally the case regarding our designs, woven samples of each one, and we are, therefore, in a position to speak of their worth with confidence.

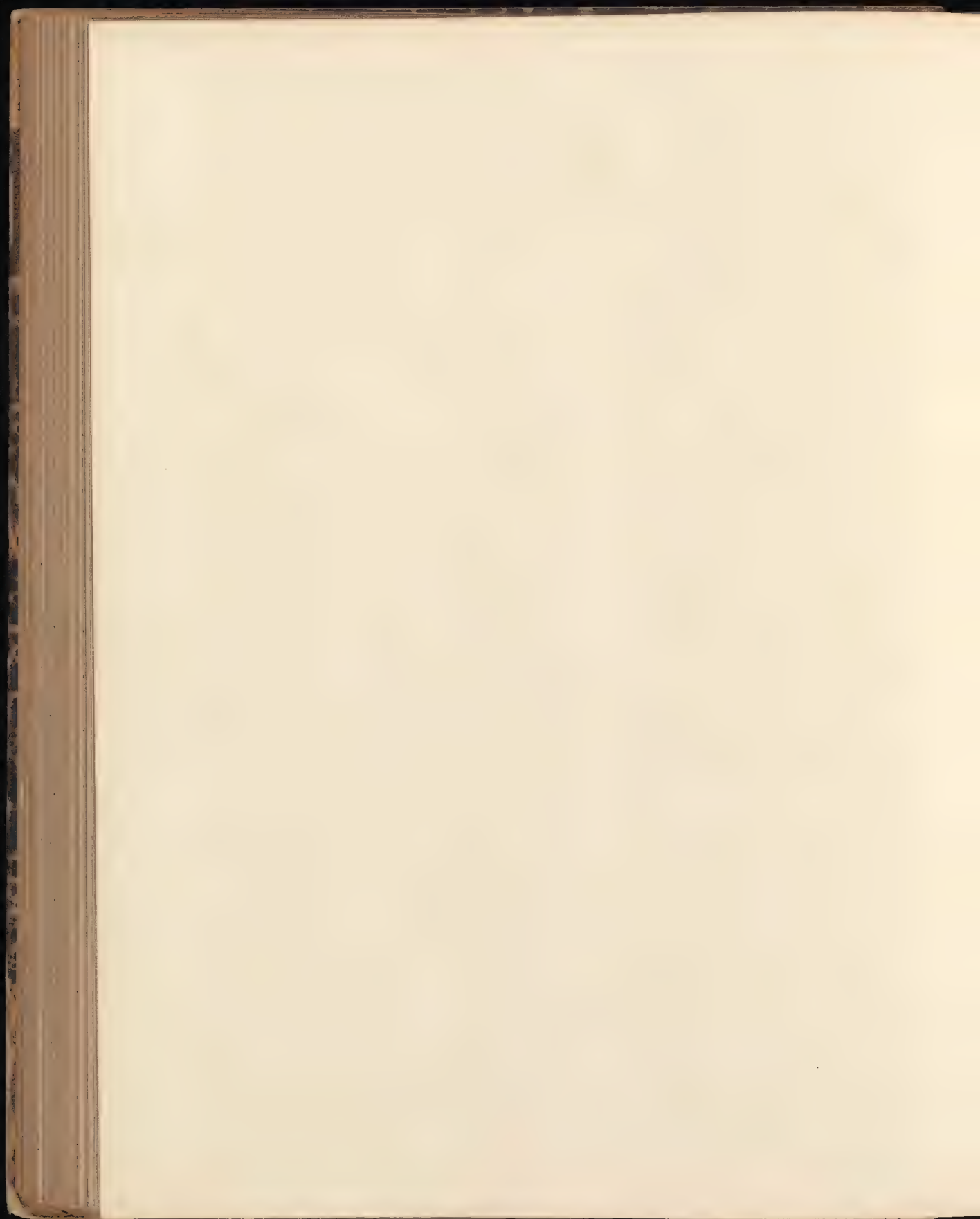


12TH APRIL. 1886

DESIGNED BY GEO. LEES



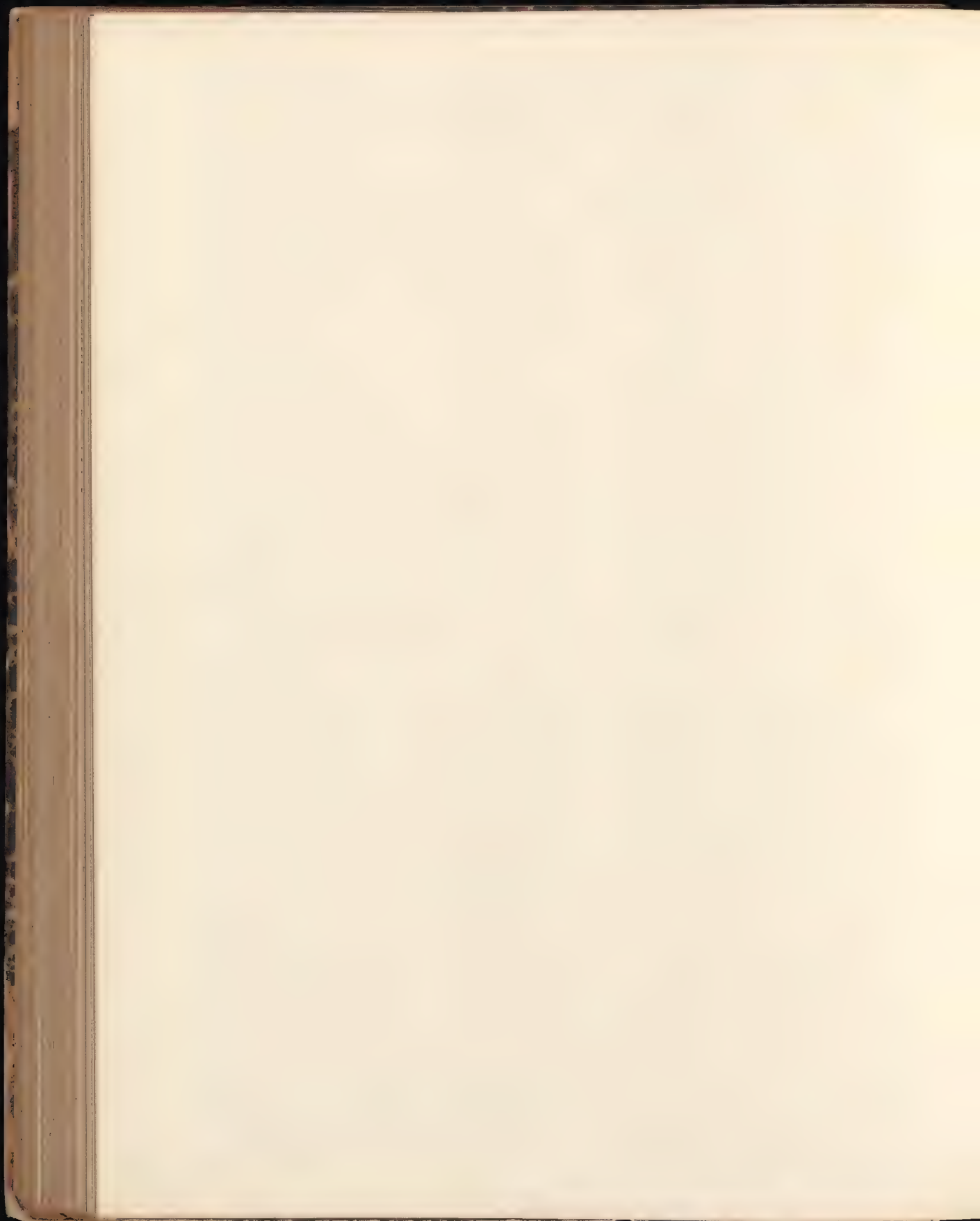
ORNAMENTAL DESIGN







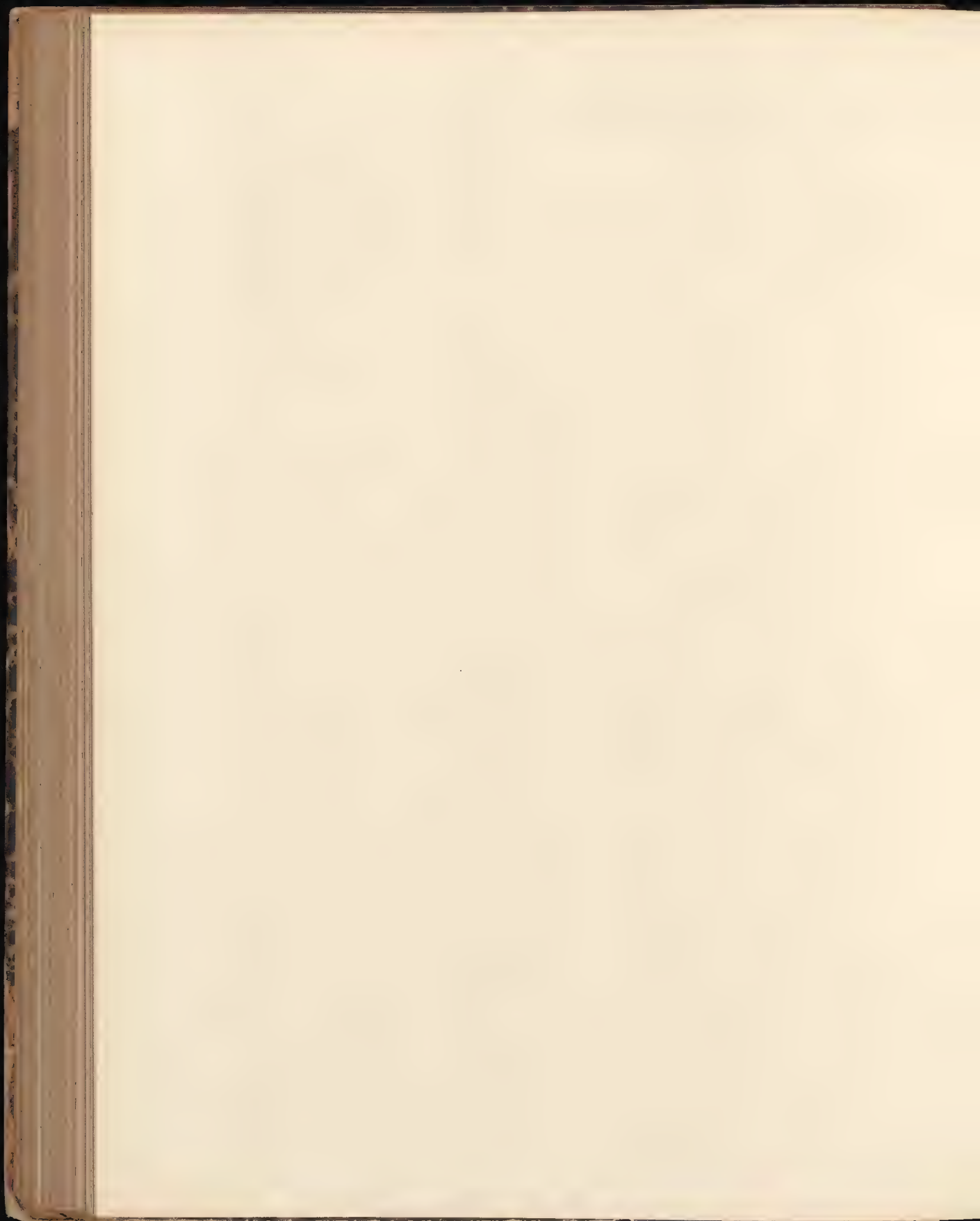
BORDER FOR DRESS GOODS.







SILK HANGING.





**Worsted Suiting.**

No. 347.



Design.

Warp :

4 Black 2/52 worsted.  
1 Scarlet 2/60 silk.  
9 Black 2/52.  
5 Rifle Green 2/52.  
5 Black 2/52.

24 ends.

Weft :

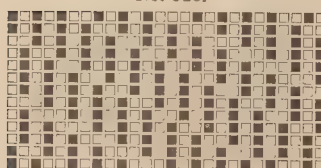
1 Black 2/52.  
1 " 15 skeins woollen.  
1 " 2/52.  
1 " 15 skeins woollen.  
1 " 2/52.

96 picks per inch.  
18's reed.  
1 reed with 4 ends.  
4 reeds with 5 ends.  
66 inches wide in the loom.  
56 inches wide when finished.

5 picks.

**Worsted Coating.**

No. 348.



Design.

Warp :

3 Black worsted. 2/48.  
1 Black worsted, and Lt.  
silk, 2/60 Blue.  
3 Black worsted.  
1 Black worsted & Bright  
silk, 2/60 Scarlet.  
3 Black worsted.  
1 Black worsted and other  
silk, 2/60 Green.

12 ends.

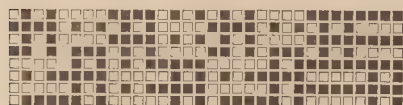
Weft : All Black.

Single 60's. Two picks  
in one shed.

100 picks per inch.  
6 ends in each split.  
20's reed.  
64 inches wide in the loom.  
54 inches wide when finished.

**Worsted and Mohair Mantle Cloth.**

No. 349.



Design.

Warp :

All Black, 2/56 worsted.

Weft :

1 pick 45's worsted.  
1 " 2/48 mohair.

2 picks.

115 picks per inch.  
4 ends in each split.  
30's reed.  
66 inches wide in the loom.  
54 inches wide when finished.

**Worsted Mantle Cloth.**

No. 350.



Design.

Warp :

1 Black 2/52 worsted.  
2 " 2/36 "  
1 " 2/52 "

4 ends.

Weft :

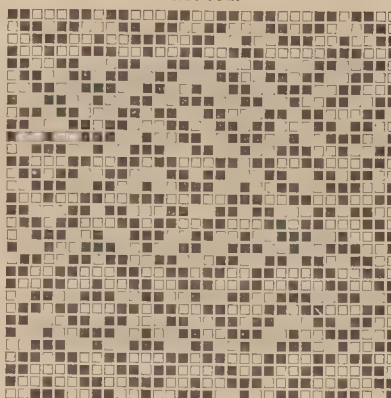
1 2/52 worsted.  
1 11 skeins woollen.  
1 2/52 worsted.

3 picks.

90 picks per inch.  
4 ends in each split.  
22's reed.  
66 inches wide in the loom.  
56 inches wide when finished.  
Very clear finish.

**Woollen Coating.**

No. 351.



Design.

Warp :

1 Lt. Blue, 25 skeins.  
2 Lt. Brown "  
1 Scarlet "  
4 Black "  
1 Lt. Blue "  
2 Lt. Brown "  
1 Scarlet "  
4 Black "

16 ends.

Weft :

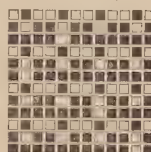
1 Scarlet and Blue.  
2 Lt. Brown.  
1 Scarlet and Blue.  
4 Black.

8 picks.

48 picks per inch.  
4 ends in each split.  
12's reed.  
70 inches wide in the loom.  
56 inches wide when finished.

**Ottoman and Soleil Mantle Cloths for Spring Season, 1887.**

No. 352.



Design.

1 pick 8 skeins wool.

1 " 12 "  
1 " 2/4 " "

99 ends per inch.  
66 Botany worsted, 2/52.  
33 Black cotton 2/40.  
60 picks per inch.  
3 ends in a split.  
33's reed.  
60 inches wide in the loom.  
56 inches when finished.

No. 353.



Pegging Plan.

Face warp 2/52 Botany worsted.

Back " 2/40 Black cotton.

Face weft 2/40 " "

Backing 8 skeins woollen.

Drawn 1 worsted.

1 cotton.

1 worsted.

60 picks per inch.

99 ends per inch.

33's reed.

3 ends in each split.

60 or 58 inches wide in loom.

56 inches wide when finished.

The above particulars are the same for  
Nos. 353, 354 and 355.

No. 354.



Pegging Plan.

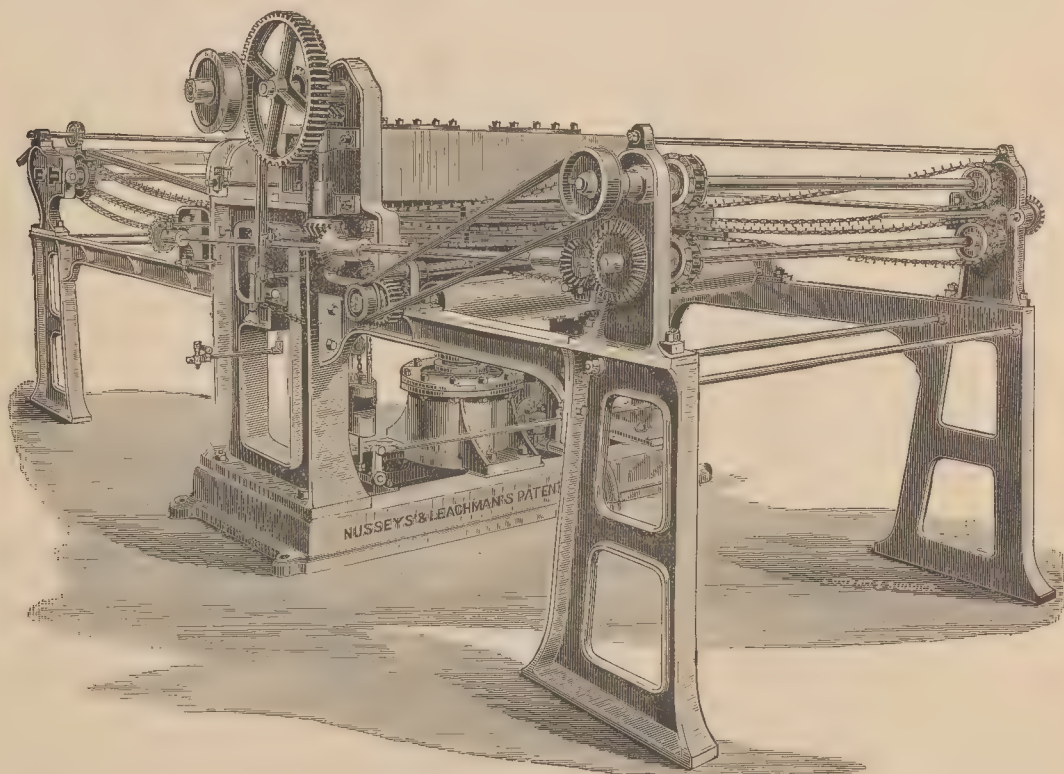
No. 355.





### Nussey's and Leachman's Patent Cloth Centering and Pressing Machine.

The machine, illustrated below, is an improvement on patents which were granted in 1872 and 1880, the main object of which improvement is to provide an arrangement, whereby the machine can be regulated to suit various widths of cloth, preventing, at the same time, press marks, and also, by an arrangement of the gearing, not only to enable the operator to set the various parts of the machine in motion, but, also, to arrest the motion with a greater degree of accuracy than formerly. While this desideratum is accomplished, the material acted upon is more effectually finished, and the face of the fabric has a smoother and pleasanter *handle* than is the case in goods finished by machines generally in vogue. The machines made, under the patents above named, have already gained a



standing in the woollen trade, and the additions which we are now describing, have made them the best for their purpose in this industry. Any manufacturer or finisher can, by visiting Messrs. Leachman and Co.'s works, have full evidence of this fact by seeing the machine in operation, and judging for himself. Within a framework, a table is employed, which is raised by steam or by hydraulic pressure (steam being the most preferable), and which is brought to bear upon a ram under the table. Above this table, a plate is carried on supports; this is described in above patents. Plates of metal, and also sheets of press paper, to any required number, are employed, the number depending upon the times the fabric has to undergo the pressing operation. After each pressing operation, the material is moved along by travelling chains or belts, and between the upper and lower pressing plates, or tables, an arrangement of plates is employed by hooks, each of which consists of two parts fitted together in a diagonal direction so as to form one plate. By the movement of one of these parts against the diagonal side of the other part, the width of such parts, forming the plate, can be reduced, or increased, to suit the various widths of the material to be operated upon. The operation is arranged so that it can be effected by the attendant simultaneously with a reduction or increase of distance between the travelling chains or belts. This is effected by a combination of gearing connecting the various parts referred to, all of which can be operated by means of a hand wheel, placed in a suitable position on the machine. The "centering" operation is

effected or performed as the material is passed backwards and forwards through the pressing operation, such material being conducted over rollers at a considerable distance right and left of the press. Hot air is blown in between the material, which imparts to it the required degree of heat for centering and drying purposes, this heated air may be obtained by passing it through a cylinder, heated by a steam pipe passing through its centre, or from some other convenient source. In order to remove all press marks after the above mentioned operation of pressing, the material is passed over a steaming box mounted within the framework, and then between pressing rollers, which may consist of two or more sets; such sets may be alternately hot and cold, or all hot, or all cold, this entirely depending upon the nature or quality of material operated upon. It is very important in this machine that the movement of the material should cease with certainty before the pressing operation commences. For this purpose, a frictional clutch arrangement is provided, whereby the gearing, which is employed for actuating the travelling chains or straps, can be brought into action, and thereby impart the required movement to the material to be operated upon, or, by withdrawing the clutch from frictional contact, the movement of the material ceases. In order to withdraw the friction clutch, prior to each pressing operation, a projecting piece is provided on the rising table, which operates in its upward movement, on an adjustable incline mounted on a lever, engaged with the clutch, causing, by such upward movement, the lever to

withdraw the clutch from frictional contact, and thus to stop the motion of the chains as required, before the closing of the plates for the pressing operation. It is further arranged, along with the above levers and weights, in connection with the belt motion, and the cam arrangement (employed for intermittently setting in motion the lower plate for the pressing operation), so that, as the attendant, by the movement of a lever, brings the press into operation, or stops the same, he can also throw the friction clutch in or out of action by the one operation. As some materials require merely the stretching and centering operation, when additional heat is required for such operation, that part of the machine is enclosed for the purpose of keeping in the heat, and the pressing operation is also dispensed with, the material being passed over the hot pressed plates as often as may be required. The machine not only requires less space than any other centering apparatus (being only 22 feet long, 9 feet wide, and 7 feet high), but less than half the steam and power generally needed. There is no damping of pieces wanted, nor rolling nor blowing to remove creases, and the cloth that is being acted upon can be seen its entire length, and be got at readily. The material, when leaving the machine, has the appearance and softness of finished goods. Serges, and such like fabrics, that require no cutting, can be finished at one operation. Cloths that are dyed in the piece, if passed through the apparatus before the operation, have more lustre, fewer creases, and are brought out in better condition than is generally the case. The machine is being made by Messrs. Leachman and Co., machinists, Leeds.



### Howorth's Patent Attachment to Gas Burners.

During the past two months, we have given articles, treating on the efficient and economical lighting of mills, sheds, dye-houses, &c., in all its bearings. These have greatly interested the readers whose benefit it is to study the question in its various aspects. The saving of so many lights is equal to so much money gained; and when profits are so very small, it is expedient that every mill owner should look closely into matters relating to improved results, accompanied by a reduction in expenditure. Since these articles were written, a contrivance has been brought before our notice for increasing the illuminating power of gas, which contrivance is simplicity itself, and, when tested, fully bears out the claims made for it by the patentee. A very brief description of the "attachment" will suffice. It is made of slightly tempered steel, and has no mechanism whatever. From illustration (Fig 1), the shape of the patent as fixed on the gas-burner (two-holed) will be easily understood, the upright piece being adjusted exactly across the top of the burner, and between the two holes, as shown in Fig 2. This upright piece, or plate, divides, or splits, the blue portion of the flame, and allows a certain quantity of air to mix with the gas at the same time; the admixture of air with the flame, causing a larger portion of it to burn white; it, therefore, emits at least 25 per cent. more light. We have tested a number of attachments, and have proved their value; we can, consequently, recommend them alike to large and small consumers of gas. As the price (under one penny each), places them within the reach of all, we prophesy for the "attachment" a ready sale.

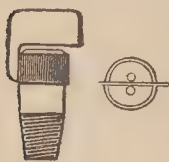


Fig. 1. Fig. 2.

### Important Novelty.

In these days of inventions and discoveries, the *bona-fide* qualities of which very often turn out to be more or less illusory, or impracticable, it gives one pleasure to be able to chronicle the existence of a "thorough good thing." *Tuteur's Belting Glue*, judging by the testimonials brought before our notice, gains ground day by day amongst manufacturers of all kinds, both in this country and abroad. It is a glue made by a secret process by Mr. Emil Tuteur, of 72, Mark Lane, London, who, by great perseverance, has succeeded in establishing it as a necessity in some of the best manufacturing houses. It is suitable for securing the joints of leather belting, and rendering them unbreakable; it glues leather to iron, and is highly adaptable for many purposes, where ordinary glue would be quite useless. Amongst other purposes for which it is suitable, we are informed that a leading manufacturer of twine and rope is thinking of utilising Tuteur's glue in the making of his goods. Mr. E. Tuteur possesses a long list of testimonials received from those who have proved practically the value of his glue, a full copy of which he will forward to any one who may write him for that purpose, and the most recent copies of which will be found in his Advertisement in this Journal.

### Co-operation and Manufacturing.

At the recent conference of co-operators held at Hebden Bridge, Mr. G. Thomson, of Huddersfield, read a paper on co-operative manufacturing. He said:—"That more than ten years ago he wrote urging co-operators that, if they wanted to rid themselves of the evil of unrestricted competition, they must start, in connection with one of their societies, a concern for the production of a leading article of their consumption—woollen cloth—upon sound economic principles, every yard of which cloth should be stamped with the trade mark of the society as a warranty for its genuineness, and pointing out the higher advantages of giving the employed opportunities, if they were provident, of making more ample and early provision for declining years, and of forming in the end a vast class of persons wholly different from the then existing operative members of society, possessing each a moderate competence, able to provide, therefore, more of the real comforts of life, and to devote some leisure to the attainments of a liberal education, and to other objects of free life. His friends then said that the time had not come for such an experiment. Nor would the time ever come when they could make a success of co-operative production by following in the footsteps of the present industrial system, with its unlimited competition, "buying in the cheapest market, and selling in the dearest" theory of business—for we could not get a body of men to consciously practise long the occult methods of theft which individual employers were not ashamed to practise and to defend, without in the end robbing us. Thoughtful men and women could not be employed making and selling bad goods—a more deadly form of theft to the nation than open robbery, where a man knew his loss—without in the end being degraded themselves. There was scarcely an article of daily consumption which was not, in one way or another, adulterated, and all to put additional

profits into the pockets of the middleman, pedlar, or merchant, who was ever encouraging cheapness at the ruinous expense of unfitness. Their gains were made in deceiving an ignorant public with trumpery goods on the one hand, and in availing themselves of the necessities of the producers to get things at unremunerative prices on the other. Even the Scotch, who had maintained their reputation for honesty of manufacture for years, had at last been forced into the downward path by that parasite of modern commerce—the middleman. We could only deliver ourselves from this cancer of competition by a well-organised system of co-operative production, where, after due allowance for interest on capital, the profits would be divided, through the store, to the purchaser and to the workman whose skill creates them. The inducement to practise the methods referred to would then no longer exist. We should also promote that most important element of human progress—the social and moral improvement of the wage-earners, who would, by their higher standard of life, furnish a market, for the consumption of our productions, more permanent and satisfactory in its ultimate results than the wild schemes of the socialists and anarchists. A discussion followed the reading of the paper.—Mr. Illingworth (Bradford) said that, at present, manufacturers were stuck in a corner. Now, therefore, was the time for co-operators to go in for co-operative production. Despite the figures of Giffen, Leone Levi, and others, he held that the workers of the country did not now receive so much of the national income as they did one hundred years ago. Co-operative production would go far in the way of providing a remedy for existing evils. Mr. Campbell (Leeds) held that the purchaser was not entitled to share in the profits of co-operative production. Only capital and labour were required to produce an article of any kind, and, after the capitalist had got a fair return for his money, the profits ought to go exclusively to the man whose labour produced them. This, he thought, could be done by co-operative societies.—A number of other delegates also spoke, of whom, several took exception to Mr. Thomson's contention as to the effect co-operative production would probably have in the way of securing the use of a superior quality of goods. Some of the delegates declared that the endeavour to sell pure goods had been the bane of co-operative production in the past. This, it was stated, had been the cause of the failure of the factory at Littleborough, which had found itself unable to compete with the manufacturers of shoddy goods. It was, therefore, suggested, by one or two of the delegates, that co-operative productive concerns should, in the meantime, supply their customers with such goods as they wanted, in the hope that, by and by, co-operators might be educated into appreciating, only, goods that were not adulterated."

### Comparison of Exports of Different Nations.

The share, which each country has in the exports of textile goods of all countries, is shown by the following table. The total exports of the seven following countries were in 1882 \$1,099,475,000 divided as follows:—Total exports of textile goods from England \$580,500,000, from France \$248,950,000, Germany \$139,500,000, Belgium \$43,000,000, Switzerland \$38,175,000, Austria-Hungary \$31,500,000, and the United States \$17,850,000. The exports of textile goods from England represent 52.47 per cent. of the total exports of all countries, those of France 22.48 per cent., Germany 13.27 per cent., Belgium 3.88 per cent., Switzerland 3.45 per cent., Austria-Hungary 2.84 per cent., and the United States 1.61 per cent. These percentages are for 1882. For 1885 the percentage of the German exports would be found much higher than the above. Dividing the goods into various classes, the following table (always referring to 1882) is obtained:—

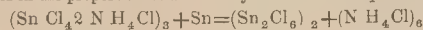
Share of the Exports for each Country, per Cent.

	Ger- many.	Austria.	Switzer- land.	Eng- land.	France.	Bel- gium.	United States.
Cotton goods ..	5.8	0.7	3.5	74.9	10.8	1.1	3.2
Woollen goods ..	22.2	4.9	..	37.1	33.1	2.5	0.2
Silk goods ..	18.1	1.2	12.8	9.6	57.2	0.8	0.3
Clothing, linen, and dress goods ..	25.5	3.7	..	46.3	17.1	6.0	1.3
Cotton yarns ..	8.0	0.5	6.6	78.4	4.4	1.5	0.6
Linen goods ..	7.2	8.5	..	60.7	13.4	8.7	1.5
Wool yarns ..	16.0	4.7	..	39.4	19.2	20.2	0.5
Linen yarns ..	3.0	13.7	..	24.2	17.4	39.7	2.0



### The Purple of Cassius.

The Industrial Society of Mulhouse offers a prize for the application of the Purple of Cassius to the colouring of textiles, and the offer will awaken no little interest among professional dyers and tissue printers on both sides of the Atlantic. Two centuries have passed since the experimenter, whose name it bears, published an account of the preparation of this pigment. Before his day, it was used to colour ruby glass. Since, it has been employed, not only to colour glass, but to ornament porcelain and to prepare red enamels. Many chemists have tried to improve the process of producing it, but the difficulty of obtaining samples capable of giving exactly the same shade of red is still extremely great. Nor, indeed, is the chemical composition of the pigment definitely agreed upon. In nearly all processes of preparing it, solutions of auric chloride and stannous chloride are mixed, the latter containing some stannic chloride; but the processes differ widely in the methods of preparing these chlorides in their degrees of dilution, and in the proportions in which they should be used. If a solution of stannic chloride alone be added to a solution of auric chloride, no precipitate is formed. If, to a solution of stannous chloride, auric chloride be added, a brown precipitate, containing much gold and little tin, is thrown down. If the solution of stannous chloride be very dilute, the precipitate containing tin and gold is purple. If the proportions be one part auric chloride to a solution of tin, composed of two parts of stannic chloride and one part stannous chloride, the precipitate is of a brilliant purple. The solution of tin thus composed is to be added to that of gold very dilute. The ammoniacal stannic chloride found in commerce is recommended by Bolley, who heats 1.07 parts tin-foil in a solution of 10 parts ammoniacal stannic chloride to 40 of water. After the tin is dissolved, add 140 parts of water, and the solution will contain the stannous and the stannic chlorides in the proportion in which they exist in the sesqui-chloride.



Ammoniacal                      Stannous-                      Ammonium  
Stannic chloride.                      stannic chloride.                      Chloride.

By increasing or decreasing the quantity of tin-foil, the proportions, between the two oxides of that metal, may be so varied as to give the purple of different shades. Again, the pigment may be made from alloys of gold, tin and silver, by dissolving them in nitric acid. To 10 of gold, the proportions of tin vary from 5 to 250, and of silver from 40 to 5000. These are fired in a crucible under borax to prevent oxidation of the tin when the alloy is treated with nitric acid; the silver dissolves out, and the tin, as stannic acid, remains with the gold in the form of a purple spongy mass. Chemists differ as to the condition in which gold exists in the purple of Cassius. Formerly, it was thought to be oxidised, but now the opinion begins to prevail that it is in the metallic state, and very finely divided. This opinion would seem to be sustained by some of the operations of the decorator of porcelain. He applies the pigment, mixed with an aromatic oil to the proper consistence for painting. If the mixture be of such a strength that a grain of gold would cover one and a half square meters, when the porcelain has been "fired," it comes out gilded. But if the mixture be made so dilute that a grain of gold is sufficient to cover 15 square meters, then the porcelain, upon being painted with it, heated to redness in a muffle, withdrawn and cooled, will be of a beautiful red tint. The difference in the results is ascribed to the greater mechanical division of the gold in one case than in the other. Max Muller substitutes magnesium oxide which is basic, for the acid oxides of tin, and thus obtains a new purple. A solution of auric chloride is mixed with magnesium oxide suspended in water, and the mixture brought nearly to a boil. By stirring, all the gold is thrown down as auric acid combined with the magnesia, and deposited very uniformly on the outside of the grains of the magnesia, which is in excess. The precipitate, when filtered, washed and dried, will be yellow, with a light red-reflection. If this be heated to redness, the hydrated magnesia loses its water, the auric oxide its oxygen, and the mass becomes rose coloured. This will be the case when the proportion of gold to magnesia is but one-tenth of one per cent., and as the proportion is increased, the colour deepens, until a rich carmine is obtained. When alumina is substituted for magnesia, and the aurate of alumina formed is heated, the adhesion between the gold and the alumina is greater than that between magnesia and the metal. Moreover, with alumina, the red colour is quite perceptible when the proportion of gold is but three one-hundredths of one per cent. From very dilute solutions of gold, the precipitation is sometimes too tedious. It may be hastened by the addition of a 10 per cent. solution of glycerine and of hydrate of soda. Thus, a very beautiful rose colouration may be obtained if, to 10 cubic centimeters of the above solution of glycerine, 0.0025 grams gold in the state of chloride, and 80 c.c. water, 10 c.c. solution caustic soda of the above strength be added. If the mixture be agitated briskly, the colour appears, but it is of short duration. Here the proportion by weight is 1 to 40,000, and an educated eye can see the colour struck when the dilution is 1 to 100,000. The formation of a red colour by means of this purple of gold, is not confined to mineral solutions only. Organic bodies and woven stuffs may also be coloured by it. If a piece of well scoured white silk be put in a hot aqueous solution, containing three-tenths of one per cent. of gold, and be allowed to soak thoroughly, and then be transferred to a warm, reducing

bath of glucose and potassium carbonate, the silk is dyed intensely red. If examined with the microscope by transmitted light, the threads of silk will appear to be transparent and of a magnificent red. The effect is that of strings of rubies. The process by which these exquisitely beautiful results have been obtained is still, so far as we are aware, without industrial application. Our fellow craftsmen, of the Mulhouse Society, appear to be the first to attempt to bring about such an application by means of the stimulus of a prize. We heartily wish them a grand success.

### The Cotton Crop and its Movement.

A despatch from New Orleans, dated March 8th, gives the cotton movement, of the United States, as made up by H. C. Parker, secretary of the National Cotton Exchange, for the six months ending with February, as follows:—

	Bales.
Port receipts .....	4,530,696
Total overland shipments.....	815,727
Of which to mills.....	599,062
Of which to ports.....	175,360
Of which to Canada.....	17,867
In transit overland .....	23,458
Spinners' takings, February.....	181,261
Overland shipments, February .....	67,964
Total takings, Northern spinners .....	1,318,853
At sea between ports.....	23,552
Exports to Great Britain .....	1,538,172
Exports to France.....	310,718
Exports to Continent .....	1,018,253
Total Exports.....	2,867,143
Stocks at port at close of February .....	1,029,595

Total supply in sight at ports and points of crossing overland, and stocks reported at interior towns to close of February was 5,600,277 bales, against 5,095,233 last year, and 5,651,267 in the big crop year, 1882-83. The home spinners' takings this year are the largest on record. The last report of the Department of Agriculture says that the average date of the close of picking varies from November 25th, to December 11th, but the averages for the cotton belt were about nine days later than usual this season. The quality is poorer than last year on the Atlantic coast, with much discoloured and trashy fibre. The staple is shorter than usual, except in favoured locations West of the Mississippi, and the yield of lint, which should average at least 32 per cent, is only 31 in most of the belt. The quantity on the plantations, February 1st, was apparently about one-sixth of the crop, the rest having gone forward to the ports, where it arrived about February 5th. Indications point to a crop approximating to the November estimate of yield per acre, which looked to a product of about 6,500,000 bales.

### Commercial Failures.

According to *Kemp's Mercantile Gazette*, the number of Failures in England and Wales gazetted during the four weeks ending Saturday, March 27th, was 455. The number in the corresponding four weeks of last year was 377, showing an increase of 78, being a net increase, in 1886, to date, of 107. The number of Bills of Sale published in England and Wales for the four weeks ending Saturday, March 27th, was 1,060. The number in the corresponding four weeks of last year was 1,022, showing an increase of 38, being a net increase, in 1886, to date, of 74. The number published in Ireland for the same four weeks was 68. The number in the corresponding four weeks of last year was 72, showing a decrease of 4, being a net increase, in 1886, to date, of 46.

Scouring or removing oil from substances, such as wool and woollen cloth, by means of infusorial earth, has been patented by Groth. The kind of earth is one that absorbs a great quantity of liquid, and is what is used to absorb nitroglycerine and make it into dynamite. The patentee states that it is this extraordinary power of taking up liquids which enables it to withdraw oil from textiles containing it. The process is to warm the textile with the infusorial earth in some apparatus where the temperature may exceed, by ten or twenty degrees, the melting point of the oil or grease. As soon as it is liquefied, the infusorial earth takes it up from the textile. After this, the materials are passed through warm water, which washes off the infusorial earth, leaving the fibre clean. If, instead of infusorial earth, we read fullers' earth, the principle of the process will be found very ancient.



## Soaps for Textile Goods.

The importance of having good soaps, free from adulteration, cannot be too highly recommended in every branch of textile manufacturing. Unfortunately, at present, adulteration, more or less, is constantly carried on by numbers of makers of this commodity, to the great disadvantage of the textile community. Many adulterations have no evil effect upon fabrics, but the admixture of certain ingredients that simply are of no good, and that evaporate when in use, makes the soap a rather dear article to the user. Water is, of course, to a certain extent, present in various soaps, but this ought, really, not to be more than from 20 to 50 per cent., according to the description. This in soft soaps should range from 40 to 50 per cent., but, by manipulation, as much as 80 per cent. is often added; this really makes the article nearly double the price it ought to be. To detect the quantity of water present, a good test, and one that invariably gives good results, is to take 1,000 grains of soap, reduce it to fine shavings, and dry it at a heat of 212° Fahr., when the loss of moisture will be ascertained. Slater, in his "Manual of Dyewares and Colours," says—when several samples have to be compared, a good idea may be obtained by putting equal weights of each into a number of small tin cups, pouring upon each the same measure of boiling water, which should not be much more than will suffice to dissolve them, stirring, till melted, and then setting them aside. When cold, they will be found to have formed jellies, differing greatly in consistence, according to their respective amounts of water; the dry samples being firm, whilst those containing large proportions of water will be semi-fluid. Soaps consist of any of the three alkalis—soda, potash, and ammonia, in combination with one or more of the fatty acids, especially oleic, palmitic, margaric, and stearic. As a rule, soaps that are made from soda are hard, those from potash form what are generally termed sweet, or soft soaps; and those from ammonia are of a semi-fluid nature, used principally for medical purposes. The nature of the fatty acid employed has an influence on the consistence of the article. The harder the soap—other things being equal—the more stearic acid is contained, whilst the softer kinds have a predominance of oleic acid in their composition. In addition to alkali, and fatty acid, many other substances are present in soaps, in certain quantities. The principal are glycerine, water, alkaline sulphates, chlorides, and carbonates from the impurities in the potash or soda employed; also rosin, silicate of soda, clay, ground flints, fuller's earth, gelatine, farina and dextrine. In the production of soaps, the makers have kept pace with the improvements in other departments in manufacturing, and, in many cases, also in dexterity in adulteration, which has deteriorated the value of the commodity. Glycerine is an important constituent of every kind of oil and fat, in which it exists in combination with the fatty acids above mentioned. When these, in the process of soap making, combine with soda and potash, the glycerine is set free, and, in the case of hard soaps, is drawn off, along with the spent lyes. In the soft soaps, it remains blended with the mass. Its presence is not an adulteration, except in large quantities, as it has a tendency to give the soap a smoother action when used upon any fibre or fabric, and this advantage the makers of hard soaps try to gain by processes which retain a certain percentage of the glycerine. In soft soap, the caustic alkali from which it is made is never quite pure, and, therefore, sulphate and muriate of potash are invariably present. They are no detriment to the quality, unless in excess. In the harder kinds, the sulphate and muriate of soda are not generally found, since the impurities in soda are removed in the spent lyes. To harden soft fats, some makers use sulphate of soda in various quantities, according to the degree of hardness required. In adulteration, common salt is occasionally used, but the detection of both the above is not a matter of any difficulty. If a little of the soap is dissolved in distilled water, to which is added sufficient pure nitric acid to combine with the alkali, and to cause a separation of the fat, the latter will rise to the top. After this is done, the clear liquid beneath it must be poured off, and, to one portion, a little nitrate of baryta, dissolved in pure water, must be added. If a white precipitate is formed, alkaline sulphates are present in the soap.

To another portion, add a solution of nitrate of silver, and, if a white curdy precipitate is formed, either muriate of potash or common salt is present.

(To be continued.)

## Bradford Trade with the United States.

The following statement, showing the value of declared exports from the consular district of Bradford to the United States, during the month of March, 1886, with the corresponding month of 1885 exhibited for comparison, has been prepared by Mr. W. F. Grinnell, United States Consul for Bradford:—

Articles.	March, 1886.			March, 1885.			Increase.			Decrease.		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Stuffs.....	132456	11	11	68378	14	10	64077	17	1	—	—	—
Worsted Coatings ..	54570	6	9	22903	12	9	31666	14	0	—	—	—
Worsted Yarns ....	43205	13	11	1900	2	2	41305	11	9	—	—	—
Mohair ditto. ....	1723	8	3	1722	4	9	1	3	6	—	—	—
Other ditto. ....	2515	3	7	1280	16	9	1234	6	10	—	—	—
Silk Seals, Plushes, &c.	24956	10	11	10767	11	4	14188	19	7	—	—	—
Waste (Worsted) ..	15958	17	7	4495	0	10	11463	16	9	—	—	—
Wool .....	15477	9	8	5537	18	7	9939	11	1	—	—	—
Carpets and Rugs ..	10318	19	10	4689	2	11	5629	16	11	—	—	—
Machinery .....	6706	7	7	7980	1	11	—	—	—	1273	14	4
Woollen Goods ....	4373	17	7	4116	2	0	257	15	7	—	—	—
Cotton Goods .....	3830	5	11	1039	5	3	2190	19	10	—	—	—
Mohair Goats' Hair..	3207	8	11	511	15	6	2695	13	5	—	—	—
Noils .....	2107	19	11	570	9	6	1537	10	5	—	—	—
Iron, Steel, &c. ....	1804	19	6	1931	18	3	—	—	—	126	18	9
Hair Cloths .....	1225	0	6	446	15	8	778	4	10	—	—	—
Shawls, &c. ....	1086	3	10	621	17	5	464	6	5	—	—	—
Camels' Hair .....	708	13	6	6667	18	0	—	—	—	5959	5	2
Hemp Bagging .....	565	7	11	780	13	0	—	—	—	215	5	1
Leather .....	558	10	6	337	12	7	220	17	11	—	—	—
Tp'stry, Damasks, &c.	363	0	8	238	4	9	124	15	11	—	—	—
Silk Waste .....	309	13	4	1555	12	7	—	—	—	1245	19	3
Card Clothing .....	237	9	8	145	14	8	91	15	0	—	—	—
Cow and Calf Hair ..	208	5	5	611	4	4	—	—	—	402	18	11
Miscellaneous .....	172	10	7	—	—	—	172	10	7	—	—	—
Chemicals .....	168	5	3	697	1	5	—	—	—	528	16	2
Tape, Braid, &c. ....	157	13	4	—	—	—	157	13	4	—	—	—
Grease, &c. ....	155	4	5	—	—	—	155	4	5	—	—	—
Paper .....	31	12	7	63	1	4	—	—	—	31	8	9
Cotton .....	—	—	—	744	2	3	—	—	—	744	2	3
Totals .....	329161	12	6	151334	16	0	188355	5	2	10528	8	8
Increase for the month.....							£177,826	16	6			
Increase for the quarter.....							£492,074	4	7			

## Air Telegraphy.

Mr. Edison comes forward with a plan for projecting telegraphic messages through the air. He has found that he can throw a stream of electricity 580 feet through the air, and, thus discharged against special receiving surfaces, can be made to transmit telegraphic messages by the ordinary Morse system. Thus, electricity generated on a railway train can be made to pass, in a succession of waves, up to, and along, the telegraph wires which run along the side of the line. The importance of this new development of electrical science cannot be over-estimated. Railway collisions ought to become things altogether unknown, for one train will be able to communicate with another on the same line, and the whereabouts of any train can be ascertained at any point on the line. Men of business will be able to telegraph from the flying express to their customers and correspondents, and what results may ultimately be obtained from the further application of "air telegraphy" it is impossible to foretell; but every increased facility for communication means living at a higher rate of speed for those who avail themselves of it, and this new victory over time and space means a corresponding acceleration of human thought and action.

Attention is drawn in the *Mulhouse Bulletin* to a process of embossing and putting on a colour at the same time, which is being successfully worked at Lyons by Vignet and Sons. The process consists essentially in placing upon the article to be embossed a cloth or a thick paper, which has previously been treated with a colour containing a large proportion of glycerine. The two tissues in perfect contact are then passed between the embossing rollers; the roller, which carries the design in relief, is heated by steam. The result is the instantaneous production of an embossed effect, and a dyeing of the depressed part, while the plain part of the cloth remains of its original colour. Two specimens of the work done are given with the *Bulletin*. The appearance is novel and agreeable. The Mulhouse Society have awarded their silver medal of the first-class to the inventors.



### Receiving Orders.

Megson, G., and J. Megson (trading as Graham Megson and Co.), Ossett, Yorkshire, mungo manufacturers.  
Johnson, A., 19, Queen Street, Leek, Staffordshire, silk broker.

### Adjudications of Bankruptcy.

Cockcroft, J., Roomfield Lane, Todmorden, Yorkshire, cotton and linen manufacturer.

### Dividends.

Airey, G., and B. A. Airey (trading as B. A. Airey and Co.), Victoria Mills, Brighouse, Yorkshire, silk merchants, i.e.; Office of the Trustee, Jonas Dearnley Taylor, Townhall Buildings, Crossley Street, Halifax.

### Dissolutions of Partnership.

Bairstow, T., and J. Seymour, 2A, May Street, Mount Pleasant, Liverpool, wool extractors.  
Balthasar, O., and C. Hickling, 6, Argyll Place, Regent Street, London, lace merchants and manufacturers.  
Bilbrough, T., and W. H. Hartley, Leeds, Yorkshire, woollen manufacturers and cloth merchants.  
Middleton, R., R. Jones, and H. T. Jones, 6, Chorlton Street, Manchester, velvet and velveteen manufacturers.  
Riley, G., J. G. S. Coleman, Airedale Buildings, Burton Street, Leicester, hosiery and stockinette manufacturers.  
Thompson, J., and R. Thompson, Padham, cotton spinners and manufacturers, and at 10, Norfolk Street, Manchester, cloth salesmen and commission agents.

### PATENTS.

#### Applications for Letters Patent.

Application of certain fibrous materials for the manufacture of yarns for making healds, dupes, jacquards and other harness, and other similar gear used in looms, lace and other machinery employed in the manufacture of woven and other textile fabrics. W. Whitaker, London. 26th Feb. 2,819  
Apparatus employed in spinning mules. P. Crook and G. Firth, London. 2nd Mar. 2,954  
Actuating dabbing brushes. P. Watson, Bradford. 3rd Mar. 2,989  
Automatic sliding anti-ballooning thread-board in ring-spinning frames. S. M. Ratnagar, London. 3rd Mar. 3,029  
Automatic self-acting shuttle guard. J. Gregson and W. T. Fox, Preston. 4th Mar. 3,060  
Actuating movable shuttle-boxes in looms. W. H. Toothill, J. Snape, and W. H. Crompton, Manchester. 8th Mar. 3,211  
Belting. F. T. K. Firmin, Glasgow. 3rd Mar. 3,028  
Bobbins for spinning and doubling frames. T. Wrigley and J. H. Wilson, Manchester. 4th Mar. 3,062  
Bobbins and spools for cap and ring spinning and twisting. J. Dixon, Sons and J. Lee, Bradford. 9th Mar. 3,279  
Bosses for pulleys, drums, &c. G. Tolson, Dewsbury. 10th Mar. 3,365  
Condenser bobbins or spools. D. S. Ingham, Dewsbury. 26th Feb. 2,778  
Cap-spinning and twisting. W. T. Garnett, Bradford. 4th Mar. 3,066  
"Clearing" and cleansing yarn in winding, &c., machines. H. Tetlow, Manchester. 8th Mar. 3,212  
Dividing the fleece (in carding machines for producing endless slubbings) into slivers by the employment of shield dividers with fixed or movable blades. A. C. Henderson, London. 26th Feb. 2,802  
Drawing and twisting slivers of wool, &c. W. R. Lake, London. 2nd Mar. 2,972  
Dressing and beaming yarns. W. Robertson and J. G. Orchar, Glasgow. 10th Mar. 3,361  
Embroidering and over-edging machines. G. Browning, Gloucester. 3rd Mar. 3,034  
Finish of stockinette fabrics. G. Lendrum and D. F. Cocks, Huddersfield. 12th Mar. 3,483  
Felt carpets. Messrs. Mitchell, Manchester. 13th Mar. 3,562  
Fastening leather on the edge of woven belting. J. Bromhall, Glossop. 13th Mar. 3,550  
Grinding card flats and doffers of carding engines. J. Bullough, Halifax. 10th Mar. 3,401

Hardened and tempered cast steel teeth for silk combs, with leather or india-rubber foundations. Messrs. Priestley, Halifax. 11th Mar. 3,413  
India-rubber driving belts, &c. J. Hebblethwaite and E. Holt, Manchester. 2nd Mar. 2,943  
Joining and constructing leather driving belts or ropes. W. White, Bradford. 22nd Mar. 3,981  
Knitted ribbed fabrics. H. Clarke, J. M. Thornton, and T. Mawly, Leicester. 6th Mar. 3,162  
Knitted or woven garments. Fritz Kob, London. 9th Mar. 3,112  
Ladder-tape looms. W. Kennedy, London. 6th Mar. 3,186  
Loose reed looms. J. Seed, London. 8th Mar. 3,246  
Letting-off motion for looms. G. and G. H. Hartley, Bradford. 18th Mar. 3,795  
Loom attachments. J. and J. Nightingale, London. 19th Mar. 3,898  
Milling machine or fulling mill used for felting tweeds, blankets, &c. J. W. Rutherford and W. Balmer, Galashiels. 8th Mar. 3,246  
Mordanting vegetable fibres. M. B. Vogel, London. 8th Mar. 3,248  
Manufacture or softening of linen, hemp, jute or other yarns. W. S. Johnston, Liverpool. 17th Mar. 3,755  
"Moser" raising gig for raising pile of woven fabrics. Messrs. Atkinson and Sutcliffe, Halifax. 25th Mar. 4,173  
New fabric for dress goods. H. Rouse, Bradford. 19th Mar. 3,880  
Obtaining and treating fibres from the backs of plants of the Urtica family and the like. Messrs. Brogden and Casper, London. 26th Feb. 2,817  
Picker preservers. W. P. Bleasdale, Halifax. 2nd Mar. 2,941  
Producing fancy yarn. J. Aspinall, Bradford. 11th Mar. 3,414  
Producing designs on textile piece goods. W. Cockcroft, Leeds. 17th Mar. 3,758  
Preparing wool, &c., for combing and drawing. J. Crabtree, Halifax. 20th Mar. 3,926  
Plush and other pile fabrics by double cloth method. F. Robinson, Leeds. 22nd Mar. 3,980  
Raising and forcing fluids, and feeding steam boilers. C. S. Madan, Manchester. 9th Mar. 3,270  
Ribbed pile fabrics. O. Drey, Manchester. 9th Mar. 3,282  
Ring and cap finishing and roving boxes. J. Dawson, Bradford. 11th Mar. 3,415  
Ring spinning and doubling. A. H. Dixon and W. J. Gradwell, Manchester. 10th Mar. 3,351  
Self-acting stop-motion for winding and doubling. R. Broadbent, Manchester. 26th Feb. 2,808  
Spinning machinery. E. Edwards, London. 26th Feb. 2,814  
Self-acting loom for weaving honeycomb and Turkish towels, &c., with fringe. T. Hirst, Ardwick. 27th Feb. 2,837  
Stretching lace curtains, &c. W. Routledge, London. 1st Mar. 2,922  
Shuttle guards for looms. T. Livesey, Halifax. 2nd Mar. 2,939  
Spinning and doubling fibres. G. Bernhardt, Manchester. 2nd Mar. 2,970  
Screw gill boxes for preparing wool, &c. G. W. Douglas and J. Shaw, Bradford. 6th Mar. 3,169  
Shuttles for looms. J. Booth, Halifax. 10th Mar. 3,359  
Shubbing and roving. W. Tatham, Manchester. 10th Mar. 3,382  
Sight-drop lubricators. R. E. B. Crompton and W. A. Kyle, London. 11th Mar. 3,474  
Sliding tug strap holders for power looms. T. Kendray and G. N. Matheson, London, Ontario. 18th Mar. 3,819  
Shuttle tongues. J. Williamson, Manchester. 20th Mar. 3,922  
Securing the picking spindles of looms. Messrs. Almond, Turner and Boothman, Halifax. 23rd Mar. 4,032  
Shuttle guard for looms. W. Dixon and F. Hibbert, Manchester. 24th Mar. 4,109  
Traversed warp machine. W. Start, London. 26th Feb. 2,782  
Treating waste fibrous substances, and utilizing the whole or portions thereof. W. Pollitt, Chickenley, Dewsbury. 26th Feb. 2,805  
Transferring designs or drawings upon paper, calico, &c. W. Gibbs, Halifax. 11th Mar. 3,412  
Travelling flats of carding engines. G. and E. Ashworth, Manchester. 11th Mar. 3,427  
Textile driving bands or belts. J. Jackson, Manchester. 13th Mar. 3,558  
Treating and preparing "Tussur" and other wild silk cocoons, and making lace, knitted warp, and other fabrics therefrom. H. Birkbeck, London. 20th Mar. 3,937  
Velvet and other pile fabrics provided with cut and uncut figures. Gustav Chwalla, London. 15th Mar. 3,662  
Warp machines. R. Thornton, Nottingham. 22nd Mar. 3,975  
Weft-stop apparatus for looms. D. Morrison, Glasgow. 25th Mar. 4,208

#### Patents Sealed.

1,232	2,369	2,380	2,498	2,908	3,051	3,124	3,161
3,419	3,803	14,190	14,274	14,376	14,387	2,256	4,091
5,609	8,983	13,208	14,595	1,649	5,600	872	2,050
3,957	378	1,752	2,322	2,415	12,321	12,890	14,608
1,954	2,735	2,946	3,207	3,360	3,437	3,450	3,491
3,636	4,148	4,212	13,381	14,501	14,694	15,101	3,825
3,940	5,182	14,577	15,391	15,421			



# The Journal of Fabrics AND Textile Industries.

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## Notices.

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## Indian Silk.

"Englishmen have an advantage which neither France, Italy, nor any other nation possesses—to wit, a great natural silk-growing country in India, capable, in the future, of supplying the whole of the world. In England we have Spitalfields, Coventry, Macclesfield, Leek, Congleton, Middleton, and other districts, which were once great producers of silk goods, but are now paralysed, chiefly from want of Government supervision in India." Such, says the *Daily Telegraph*, were some of the words employed last January by Mr. Thomas Wardle, at a meeting held, in the Calcutta office of the Indian Revenue and Agricultural Department, to discuss questions connected with silk production, and with the special measures to be adopted for equipping a "silk court" at the Indian and Colonial Exhibition, South Kensington, with Mr. Wardle at its head. At the commencement of his instructive address, Mr. Wardle informed his hearers that he was not himself a silk manufacturer, but merely a silk dyer, and a silk and calico printer, residing at Leek, in Staffordshire, who, during a lengthened experience, had enjoyed countless opportunities of examining the textures which came into his hands to be dyed and printed. It is impossible, indeed, to read his address without perceiving how thoroughly he has mastered the subject of which it treats. We may accept, therefore, as a probable truth, that it is within the power of, and, not only within the power, but easy, for Government to revive and vastly

to extend sericulture in India, and the treatment of silk in this country. It is high time that an effort in this direction should be made. In a valuable and, considering its brevity, remarkably exhaustive pamphlet "Upon the Causes of the Decline in the Silk Industry of Bengal," recently written by Mr. L. Liotard, of the Finance and Commerce Department, Calcutta, it is shown that the exports from Bengal, by sea to other countries, of raw silk, waste silk, and cocoons, have decreased from nearly £2,500,000 in 1868-69, to £985,000 in 1885-86. So dismal, indeed, are the prospects of sericulture in India, that, unless something be done to arrest the decay of the industry, it will soon be past praying for. Of the decline experienced by it, there are many explanations. By some, it is attributed to the continued fall in the price of silk in European markets, owing, first, to the supplies being larger in proportion to the demands than heretofore; secondly, to changes of fashion, necessitating the employment of cheaper fabrics; thirdly, to a much larger use of waste silk at low prices for plushes and like materials; and, fourthly, to a more general employment of Tussar silk. Others, again, believe that Bengal sericulturists are languishing from disease among the worms, from degeneration in these useful little labourers owing to the effects of climate, from a bad system in rearing them, and, finally, from a still worse method of reeling the silk from the cocoons. Mr. Wardle, however, maintains that the decrease in the use of Bengal silk is solely owing to its defective quality. The introduction of Tussar has, in his opinion, nothing to do with the question, as it is certain that, coincidently with the decline in Bengal silk, China and Japan textures have made their way into the European markets through their superior quality, and are now commanding very high prices. "Thou seest, my son, with how little wisdom the world is governed!" Had Chancellor Oxenstiern been alive to-day, he might have railed against the shortcomings of Governments, and against the laches of people who tolerate them, in much stronger words. Here, for instance, are some of the finest silk filatures in Bengal dying of paralysis, which is also overtaking our English silk centres, while nothing is being done in India to revive sericulture, and England looks on with apathy. The most flourishing and lucrative industry of our great dependency is thus allowed to go to wreck and ruin, to the destruction of half a dozen English cities. The Indian and Colonial Exhibition—the grandest testimony ever contributed to the greatness and wealth of the nation upon whose possessions the sun never sets—has been opened by Her Majesty in person. We hope that many visitors to South Kensington, during the next few weeks, will seek out the silk court in the Indian Department, over which Mr. Thomas Wardle will preside. It is but four months since Mr. E. C. Buck, the Secretary of State for the Indian Revenue and Agricultural Department, introduced Mr. Wardle to a large meeting at Calcutta as an expert whom, in 1872, Lord Salisbury, then Secretary of State for India, had consulted as to the practicability of dyeing Tussore and other Indian silks in the country which produced them, while requesting him also to go out and examine the native dyes of India. This investigation," says Mr. Wardle at Calcutta, "took eight years to complete." Meantime, he was requested by the Indian Government to take charge of their silks at the Paris Exhibition of 1878, and again left England shortly before last Christmas for Calcutta, at the request of the Royal Commission presiding over the Indian and Colonial Exhibition, to examine the causes of the decline in the silk industry of Bengal, and to see what could be done to remedy it. It is long since more important documents were submitted to the Indian and British Governments than the reports of Mr. Wardle's two addresses—the first delivered at Calcutta in January last, and the second read recently by his son at Leek. In the latter, Mr. Wardle expressed his conviction that the falling off in the silk industry of Bengal, simultaneously with the growth and active development of trade in an inferior article produced by China and Japan, was attributable solely to defective quality in the silk produced by the Bengal worms. "From lengthened microscopical examinations of Bengal silk," he exclaims, "I have convinced myself that there is no fault in the fibre, which compares favourably with Italian silk. Of the two, the Bengal article is, indeed, to be preferred, if produced by well-nourished worms, and properly reeled." We are now approaching the true causes of the decline, the chief of them being that the Bengal worm produces much less silk than his Italian brother. M. Liotard explains that the mulberry leaf, which is the worm's food, contains five substances:—(1) The solid fibrous substance; (2) the colouring matter; (3) water; (4) the saccharine matter; (5) the resinous matter. The first three, except so much of the third as serves the worm's uses, are non-nutritive. It is the saccharine matter which nourishes the insect, while the resinous, which solidifies when it comes into contact with the external air, becomes silk. Thus the quantity of the fibre emitted by the worm is in exact ratio to the quantity and quality of the leaf upon which he feeds. In Italy, the mulberries are carefully cultivated upon land of which the rent is low, and the leaves are abundant and full of sugar. In Bengal, on the other hand, the rents exacted by the zemindars or landowners from the ryots or peasants who cultivate the mulberry are excessive. "Before the American civil war," says Mr. Wardle, "the rent of mulberry lands in Bengal was about two rupees per bigha, which is the third of an English acre. During that war, however, and the prosperous years which succeeded it, rents rose as high as sixteen rupees per bigha, or forty-eight rupees per acre. Rather than lower their rents, the grasping zemindars will allow their land to lie fallow." The result is obvious. Ground down by high rents, the Bengal ryots who



rear silkworms have to provide them with leaf at an outrageous cost, so that the diligent little silk spinners are starved from deficient supplies of leaf, and even that given to them is wanting in sugar. The silk which they produce is as good in fibre as that raised in Lombardy, but it falls very short in quantity, and, from the weakness of the worms, is full of what are called knibs or blotches, which impair its market value. The glutinous or resinous accumulation discharged by the worm, which becomes solid when it touches the air, is put forth by the worm through two orifices close to his mouth, and is then a thin double fibre, which becomes one thread or strand, partly by its own gluten, and partly by the swinging motion of the worm's head as it forms the cocoon. Being insufficiently fed, and weak, the worm often becomes exhausted, and hangs down his head, in which case the gluten still goes on issuing from the two orifices, and forms a gathering of the two loose fibres, which, when reeled off, becomes knibs or knots. The remedy is patent. Let the Indian Government insist upon a lowering of rents by the zemindars. "I do not say," adds M. Liotard, "that a reduction of rents would in itself revive the industry. But it would enable improvements to be made in the leaf supply, in the rearing of worms, and in the reeling of silk, so that Bengal silk may compete upon better terms with that of Italy, China, and Japan." Here there is a good field for Lord Dufferin's exertions. The natives engaged in Indian sericulture are numbered by millions, while the land they inhabit is the best for raising silk in the world. In this country, Coventry, Spitalfields, Macclesfield, and other towns are starving for want of cheap silk, which India can supply in illimitable abundance. Of all men, Lord Dufferin is least likely to turn a deaf ear to the petition for silk dresses, matchless in quality, and reasonable in price, preferred to him from all parts of the world by *Son Altesse La Femme*.



### The Manufacture of Worsted, Woollen, and other Cloths.

**I**N our last issue we made some remarks upon the desirability of our manufacturers producing new and fashionable fabrics, and we now take the opportunity of urging them again to renewed efforts in this direction. In nearly every branch of the textile manufacture, the tendency to elaboration in details of design, colouring, and the texture of the material, becomes more apparent as time rolls on. The cloths, that were in regular use five and twenty years ago, have been gradually giving way to new makes of fabrics, such as our forefathers never dreamt of, and the adoption of what are termed fancy cloths, in every conceivable pattern, is the rule, and not the exception, nearly all classes of society preferring these to the plain makes of materials. If we take, say, the fancy dress goods trade of Manchester, Bradford, or any other leading centre in the United Kingdom, and compare the numerous varieties of fabrics, now being produced, with those of even a few years ago, the advances made in every department of manufacture are almost incredible, but the changes are hardly noticed by the casual observer, and it is only by those who are vitally interested in the production of textiles, that the constant variety is particularly observed. In the production of printed cotton goods—if the fabrics of even a dozen years ago are classed with those of to-day, the difference in design, colouring, and general effect, is most marked, and greatly in favour of the latter; and, perhaps, the great advantage to the producers of this description of textiles lies in the fact that printed cottons are now utilised for many purposes for which, years ago, they would not have been thought suitable. The same remarks apply, in a greater or lesser degree, to many other classes of fabrics that are manufactured in the cotton districts. Again, in the worsted and woollen centres, new and taking productions have been considerably on the increase, and there seems no limit to them. In the Bradford dress goods trade especially, the fabrics made have been of an ever changing nature, owing to the vagaries of fashion, which seem to affect this class of women's apparel in a greater degree than any other. Take the enormous quantities of goods made in the Yorkshire districts, in which the curled, knotted, and looped yarns have been utilised, and which are now being made in a variety of

designs and patterns, and add to them the different kinds of plainer goods; to an outsider, it would seem impossible that manufacturers could sell the large quantity of fabrics produced, but still the goods are got rid of, and the demand continues to an enormous extent. The curled, and such like, yarns cannot be said to be absolutely new, as they have, in former times, been utilised in a very small degree, but still they are new to the present generation, and have, during the past three or four years, been highly appreciated, as being out of the common run of wearing material. Then take the great development of the worsted coating industry—the ordinary makes of plain cloths, (or what would be termed *plain* at the present day), such as were favoured a few years ago, are almost relegated to the past, and a new order of fabric is in demand. Perhaps, in no section of the textile trade, has there been so marked a change as in this branch. The great variety of coatings and trouserings, now being produced in very effective patterns, have made this department, probably, the most remunerative of any in the United Kingdom. We are speaking now of the fancy branch, and not so much of the ordinary solid fabrics, in which competition has been so keen as to make it a trade not to be desired by the majority of those engaged in it. The woollens turned out must not be forgotten, as, in this branch, the rapid strides made have been almost on a par with the other sections. In designs, colourings, and general effect, the goods now before the public are in marked contrast, in every respect, to those of twenty years ago, perhaps the greatest gain being in the dyeing and finishing of the materials. Although we speak so highly of all classes of fabrics now being manufactured, we do not pretend to say that their wearing capabilities are greater than those of goods formerly in vogue, but the contrary; still it must be taken into consideration that the difference in price between cloths produced at present, and those made formerly, leaves a balance in favour of to-day's wearers, and, at the same time, they have more changes, and are generally, on the whole, better satisfied. We cannot finish our remarks without urging upon our spinners and manufacturers the necessity of continuing to produce effective cloths, if they wish to retain the hold they already have on the markets of the world. In some of the textile districts, manufacturers, who were once wealthy, and who commanded a large volume of trade, in the special fabrics they made, have now either sunk into insignificance, or have gone out of business by bankruptcy, or from sheer disgust at the unremunerative state of their labours, and this condition of things has often resulted through not having kept up to the times in changing the styles of their goods, in order to meet the vagaries of fashion. Some, whose aim it has been to cater for the ever varying requirements of the public, have made fortunes, whilst others, who have not been quite so successful, have kept their heads well above water, in striking contrast to those who have not gone with the times.

### Soap for Textile Goods.

(Continued from Page 47).

Carbonate of potash, or of soda, is found in soap when the alkali employed has not been duly causticised. It generally appears in hard soaps in the form of an efflorescence like hoar frost over the bars. Rosin is a common ingredient in yellow soaps. In all soaps intended for the use of the dyer and printer, it is an objectionable impurity, imparting to the goods an unpleasant clamminess or stickiness. Slater, in the before mentioned manual, gives the following receipt for its detection: "Dissolve some of the soap in as little boiling water as possible. Add enough hydrochloric or dilute sulphuric acid to combine with the alkali and to liberate the fatty matters. Then cover the vessel, in which the whole is contained, with a lid or a plate of glass, and set it aside for a few minutes. On uncovering it, rosin, if present, may easily be detected, in the cake of fatty substances, by its smell and taste, and by the peculiar stickiness which it imparts to oils and fats with which it is mixed." He then gives particulars of ingredients which act more or less injuriously upon fabrics, &c., as follows:—"Silicate of soda as a constituent of soaps has given rise to a great variety of opinions. Some condemn it as a mere adulteration, and even deny that it has any detergent powers. Insoluble silica and alumina, in the



various shapes of Cornish clay, powdered pumice, ground flints, potter's slip, and fuller's earth, can be, and often are, added to soaps to a considerable extent. Their action is merely mechanical, that is, they cleanse by scraping or abrading the dirt or grease off the bodies to be purified, and, of course, they roughen the fibre. This action will necessarily be unequal, and the goods will then take any dye unevenly, the colour being deposited most heavily where the surface has been most acted upon. We must therefore consider silica and alumina, if not as direct adulterations, as additions, which for manufacturing purposes, cannot be recommended. Their detection is not difficult. A weighed portion of the soap is dissolved in dilute spirit of wine; the liquid is filtered, and the insoluble matter which remains on the filter is dried and weighed. Animal matter, other than fat, such as tendons, intestines, ground bones, waste glue, etc., can be regarded in no other light than a filthy adulteration. It is to be regretted that any soapmaker should derive a portion of his materials from the knacker's yard, and that even the offal of the fish market should find its way into the soap-pan. Soaps so contaminated give a most nauseous odour to any wool, yarn, etc., that is scoured with them, and should, therefore, be carefully avoided. The detection of such impurities is not difficult. A little of the soap is dissolved in hot water, and decomposed by the addition of a little hydrochloric acid. The spurious animal matters will be entangled in the cake of fat which separates out, and may be easily recognized. Farina and dextrine are less formidable. They add, of course, nothing to the value of the soap, but they have no action positively injurious. To detect them, dissolve the soap in strong spirit of wine. Farina and gum remain undissolved, and may be separated from the other articles by filtering. Farina is then easily recognized by adding a drop or two of the tincture of iodine, which, if farina be present, will give to the mass a deep blue-black colour. Dextrine (British gum) may be dissolved out from any mineral impurities present in a little hot water, and can then be readily recognized. The normal ingredients of soap, the fatty matter, and alkali, are determined as follows:—Take 100 grs. of the sample, dissolve in hot water, avoiding excess, in a small and very light glass-beaker. Add hydrochloric acid in slight excess, and set the glass aside till the oils and fats congeal into a cake at top. This crust is then carefully pierced with a needle, the liquid poured off, and the beaker weighed. After deducting the tare, this gives the amount of fatty matter. Some analysts put along with the soap a weighed quantity—say 100 grs.—of pure white wax. The decomposition is managed as above, the cake of fatty matter and wax is taken out of the beaker and weighed. The weight, after deduction of 100 grains for the wax added, shows the amount of oil or fat. The latter process is preferable for soaps containing a large amount of oil, or of any fat that congeals only at very low temperature. A good soap should not only be free from the impurities above mentioned, and from excess of water, but should be neutral, the alkali and fat being duly balanced. If either of them be in excess, or if they are not well incorporated and combined, disappointment to the consumer must result. The quality of the fats employed is also of the highest importance. For the use of the dyer and printer, the following alone should be employed, singly or in mixture:—Tallow, palm oil, cocoa-nut oil, olive oil, rape-seed oil, and its congeners, and sun flower seed oil. Of these, common convention assigns the superiority to tallow. Nevertheless, I hold that well-made palm and cocoa-nut oil soaps leave the fibre in a more desirable condition than any tallow soap. The following oils and fats should be carefully avoided:—Train oil, cod fish oil, linseed oil, kitchen refuse, fat collected by bone boilers, grease separated out from accumulated soap-lyes. All these give evil-smelling, clammy soaps. From the foregoing portions of this article on soaps, it is to be hoped that those engaged in their use, and to whose advantage it is to have them pure and unadulterated, will gain from the particulars that have been given, bearing in mind the fact that soaps are generally used in the earlier processes of manufacturing, and that unless they are in such a condition as to carry out the necessary requirements, that each succeeding process will be less satisfactory than it ought to be. Especially in dyeing, printing, and such like processes, it is of the highest importance that this commodity should do its work efficiently, and in other branches it is also a most desirable desideratum, if goods have to be turned out of a saleable character.



### Leather Belts.

Leather, in the process of manufacture, previous to the application of grease, has little strength, and may be torn, according to thickness, much like brown paper. Grease causes such action of the fibres upon each other, that great strength comes back; in fact, the leather may be said to return to a condition akin to its original state as a hide. The ever-fertile mind of the American worker in belt leather has sought for new methods in the greasing process to gain in value of product, but to this day a universal method exists of using tallow and cod oil, these two are usually combined for the flesh side, while cod alone is used on the grain. They are allowed to slowly penetrate the leather which has first been thoroughly wet; the hides are hung in the open air, or in a drying-room, and as the water dries out, the grease penetrates, leaving, however, the stearine of the tallow, which latter is finally scraped off. The future manipulation consists in wetting and stretching, rubbing down, or stoning, finally, much working on the surfaces with a slicker and trimming. A just limit to the quantity of grease, which belt leather shall have, has been well determined, to give it a character of elasticity and toughness peculiar to no other material. It is an interesting fact that the best cod oil contains only a faint trace of an active acid. Also, in using tallow, the active acid principle, the stearine, is left upon the outside to be scraped off; thus, all which penetrates is of a neutral nature, and not injurious to the fibre. Belting is now made and carried in stock in large rolls, and by long standing, it becomes dry. When a new belt is put to work upon pulleys, there is a rigidity in its character not in keeping with our ideas of a minimum of power to be expended; ordinarily also, when a belt is put to its largest duty, there is more or less slipping. In the first making of iron-faced-pulleys, they were left rough, but pulleys were soon made as smooth as possible by finishing, a belief prevailing that a close contact between leather and iron gave the best adhesion, and then, too, if slipping occurred, less wear came to the surface of the leather. To provide for still better adhesion, pulleys are covered with leather, also with patent covering of paper. There have again come into use, pulleys made with iron arms and wood rims, also all wood pulleys. To prevent the slipping of belts, or to make them more pliable and durable, various substances have been used; powdered resin to produce immediate adhesion, or castor oil to give pliability and adhesion. The first is proved by all experience to be very injurious to leather, causing it to harden and crack. Castor oil has been much used, but never with entire satisfaction, where all conditions of a belt are considered. Castor oil has an active acid principle, also, it is drying in its nature; its continued use saturates a belt and changes its nature from its legitimate state of elasticity and toughness—a belt thoroughly filled with castor oil is in a poor condition, when it comes to repairs. The writer has given much close study to the care of leather belts, with respect to a proper dressing to apply to them, and after eight years' experience, has produced a neutral compound which thoroughly prevents slipping, while still leaving the leather practically as it comes from the belt-makers' hands. Its endurance is very remarkable, and the quantity, necessary to prevent it from slipping, is surprisingly small; it leaves nothing further to be desired. The writer does not hesitate to say that, with a polished faced iron pulley, the full value can be had from a leather belt. Whatever the conditions of use for belting, it should be positively kept free from machinery oil, and free from dust, as far as possible. Run the grain side to the pulley. Belts should be run as slack as possible, without, however, so much slackness that a flapping motion can exist; this keeps the fibres from undue strain, saves the laced joints, saves the bearings from unnecessary wear, and, perhaps, above all, prevents the shafting from being pulled out of line. The inquiry is made as to the exact cause of the electricity developed by belts. As I have observed that, in the extreme case of a dynamo belt, running over two-thirds of a mile per minute, no electricity is developed in the belt when my belt dressing is used, the question seems legitimately asked, if the electricity in belts does not come only with slipping.—*Fibre and Fabric.*



### Trade Depression and Technical Instruction.

In speaking at a special meeting of the Leeds Chamber of Commerce, Mr. Swire Smith referred at length to trade depression, and technical instruction. He said there were so many trades, and so many sectional interests in Leeds, that it was difficult for commercial men to recognise any common ground where they could unite for the good of all. Leeds was happily circumstanced as a commercial centre in its proximity to the great Yorkshire coalfield, and with its railway and canal facilities. On these, Leeds men were to be congratulated, but still more were they to be congratulated on the great diversity and importance of trades in the town. It was to the men of all classes and creeds to which Leeds would have to look for advancement. He knew of no better organisation through which commercial men might unite for promoting the general industry of the town than that of the Chamber of Commerce. The Technical Educational Commission found, in every country, hostile tariffs to protect the workpeople against the importation of English goods; operatives working longer hours than in this country; and everywhere, except in the United States, considerably less pay. Yet, when all this was taken into account, the Commission had to report that, great as had been the progress of foreign nations, "taking the state of the arts of construction, and the staple manufactures as a whole, our people still maintain their position at the head of the industrial world," and that modern trade achievements were due to the inventive power and practical skill of our countrymen. Personally, he would rather take his chance of obtaining a living and a position as an employer in this district of Yorkshire, than in any continental country he had visited; and the same might be said generally of the chances of the Leeds workmen. The one great educational advantage possessed by their continental rivals might be England's to-morrow, if the people would unite in their determination to have it so. They must not be blinded to the present keenness of the race by confidence in past superiority. In some branches, their rivals had outstripped them, not only in their own, but in neutral markets. As a fact, in every department of trade, our rivals had possessed themselves of all our material advantages. The best factories abroad were simply models of the best factories in England; and the foreigners, while studying our strong points, had not failed to notice our weak ones. While unable to compete with us in many respects, they turned attention to an industrial factor which we had ignored—the scientific and artistic training of manufacturers and artisans. In all our experience of manufacturing, during recent years, few lessons had been so hard to learn as the principle that goods must be made to attract the buyer. It had been calculated that English manufacturers lost millions a year, owing to the simple fact that, in the schools attended by our industrial population, the culture of art, as applied to manufactures, had been neglected. In the same way, much loss was accounted for by inferior dyeing. It would be recognised that our mechanical advantages were of no avail, if goods made by foreigners on the same machines were preferred by reason of their more attractive appearance. Here was the cause of the depression which had fallen upon many of our firms, and thus it was that the success of a firm, and the employment of hundreds of hands often depended, and would in future more depend, on the one or two trained men who supplied the patterns, and who could embody in the fabrics produced the qualities which attract the buyer. There were many who affirmed that our foreign trade was being killed by hostile tariffs, which, it would appear, were intended to kill it; but if England were true to herself, her trade would never be killed in this way, though she might kill that of her rivals. In spite of hostile tariffs, English foreign trade in manufactures, according to a recent article in the *Economist*, had been greater than that of France and Germany combined, and no other nation had received anything like the same quantity or value of goods from any protected country as from free-trade England. In the cloth trade, of which Leeds was the centre, nothing was more remarkable than this country's invincible position, though only a gloomy record could be given of the woollen yarn trade. The latter was not only affected by the low wages and long hours in Belgium, but had suffered because the Belgians had worked on a class of wool, which English spinners had refused because it was full of "burrs." This was Buenos Ayres wool, over the difficulties presented by which the chemical knowledge of the Belgians triumphed, giving them possession of an industry which they had continued successfully to hold. While it was clear that many British industries had suffered, both France and Germany were the poorer for their protective systems, and had it not been for the results of their technical education, many of their industries would have been ruined in the struggle with England. Countries which could supply neutral markets at the cheapest rate were always successful in securing their custom. Those countries which did not manufacture largely for themselves received the bulk of their goods for the million from England; and so long as our country was first in economy, efficiency of production, enterprise, shipping, and in commercial freedom of exchange, she would retain her command of the markets of the non-manufacturing nations. America was the most important of all neutral markets for general commodities, and was destined for many years to be the largest importer of manufactured articles. As a rule, England was beaten in the neutral markets, chiefly in those commodities in which she was beaten in her own. The fact was that, while we had been developing our machines, our rivals had been developing their men. While we were always sighing for new markets, there was in every house of the United Kingdom a market from which no hostile tariffs could repel us, if we would only learn to supply it. And we might do more than this, for the power, which enables us to overcome our rivals in our own markets, would enable us, by the aid of our shipping, to surpass them in neutral markets. All had experience of the great results achieved through the influence of schools of art, and he unhesitatingly affirmed that the faculty of taste was as strong in Englishmen as in the foreigner, when it had the same chance of development.

Having referred to the educational facilities in Leeds, he remarked that on the continent education seemed to have a more direct bearing on industrial occupations than in England. All our industrial deficiencies were to be attributed to our backwardness in art instruction, and in one respect, with regard to this, Leeds was greatly lacking, namely, in a good art museum. He hoped there would soon be an improvement in British trade. The depression would not have been without its value, if it brought employers and employed into closer sympathy and prompted the development of the faculties of the rising generation, that on the one hand the masters might be wiser and more efficient, and on the other, that the men might become better mechanics, and the mechanics better men.

### English Consular Reports on Trade Abroad in 1885.

The first fruits of the new departure recently taken by the Foreign Office have just appeared in the shape of a small volume of consular reports, all of which purport to refer to the year 1885. In some of them, the figures are made up before the close of the year, and in other cases, it is probable that the reports may have to be supplemented. At Havre, we have a Consul General—Mr. Bernal,—and under him a consul at Rouen, and vice-consuls at Caen, Trouville, Honfleur, Fécamp, and Dieppe. Reports from these points are included in that from head-quarters at Havre. Mr. Bernal's account of French trade and industry within his district is exceedingly gloomy. He says, indeed, that the dark picture drawn by him of the state of commercial affairs during 1884, "would only require the shadows to be deepened in intensity to serve for that of last year." The cry of "no profits" is, he says, heard on all sides. Still it appears that not every kind of enterprise is doing badly, and Mr. Bernal notices the fact that a Havre shipowning company, the Compagnie des Chargeurs Réunis, with a fleet of 23 steamers, of 51,500 tons burthen, had been able to declare a dividend upon last year's operations at the rate of 6 per cent. per annum. Upon the important question of the condition of the working classes in the manufacturing department covered by his consular district—the Seine Inférieure—Mr. Bernal observes that, although there has been a good deal of distress, employment has been pretty steady, and, owing to the frugal and industrious habits of the people, they have not suffered so severely as might have been expected from the bad state of trade generally. Mr. Bernal has observed the growing desire, amongst the industrial and mercantile communities in this country, for greater consideration for our commercial interests, and for better service generally on the part of our diplomatic and consular servants abroad, and this is what he has to say upon the subject:—"It is, I think, agreed on all hands, that every possible means should be taken to push and foster our trade, and I have seen many suggestions made to that effect. Among others, it has been proposed that consular officers should become a kind of general agents for this purpose, have samples of goods of all sorts, &c., sent them for exhibit, and should endeavour to bring them to the notice of the merchants and dealers of their place of residence; but a little reflection will show that such a plan would be both impracticable and impolitic. Not only are consular officers without the technical knowledge required for the work, but they have neither, from their position and the many varied duties they have to perform, the time, the means, nor the space to undertake it. Even were this otherwise, the consulate would either be so important a one that the consul's whole time would be taken up attending to its ordinary duties, or it would be of so little importance that there would be hardly any opening for our trade. Havre having become more of a place of transit than a centre of distribution, there is not as much to be done in pushing our trade as formerly, but I have been surprised to find, as far as I can learn, how rarely a commercial traveller comes here from England. I cannot help thinking this is a bad policy, and that there must be some branches of business in which an intelligent traveller, speaking the language, (this last is most essential) might do well." With regard to the German plan of sending out floating exhibitions of samples of native productions, with a view to promoting the foreign demand for them, Mr. Bernal expresses the opinion that, although this method may be usefully adopted in distant countries, a better plan would be to establish, at certain well chosen centres, permanent depôts for samples, the cost of which should be borne by an association of those interested in pushing the particular trade which it is desired to promote. The essential requisites for success are that persons should be appointed to attend the depôts who are thoroughly conversant with the articles exhibited, and that the actual cost and the import duty should, in each case, be separately stated. Mr. Chapman's report on the state of trade at and around Rouen is rather gloomy. He says that many industrial concerns, without specifying the particular kinds, are slowly disappearing. He notices that there is a prevailing desire for an increase in the protective duties at home, and for higher discrimination against foreign manufactures in French colonies, but "whether or not these would have the desired effect," he, with a degree of hesitation which seems characteristic of the consular service, says, "it is not in my province to give an opinion." As to the cotton spinning industry of Rouen, Mr. Chapman reports that it has been "gradually getting worse," that whilst prices of cotton have slightly advanced, those of "spun yarns" have gone down. Some factories had been closed, whilst in others the hours had been reduced. The manufacture of printed ginghams and Chintzes had been "very bad, the industry being likely to disappear in places, notwithstanding reduced bours." In the production of "furniture stuffs," we are told that the manufacturers of Alsace and the Vosges are competing terribly—presumably in the home market, for we are told that "only a considerable export market can save this industry in this neighbourhood." The coloured woven goods trade appears to have been very depressed, with a slight improvement towards the end of the year. Grey cotton goods were sold with difficulty, the orders from Algeria having been scarce "on account of the agricultural crisis there." Stocks at the close of the year had much increased, and general short time was talked of.



## The Depression in Trade.

(Second Report of the Royal Commission.)

The second report of the Royal Commission on the depression in trade has been issued. The document opens with a reference to the first report, which stated that the Commissioners were proceeding to consider the conditions and prospects of some of the leading industries in the country, those selected for immediate consideration being the coal and iron trades, the textile industries, agriculture, and shipping. It is interesting to notice the opinions of those examined before the Commission as to the causes of the depression, and the means to effect an improvement. We have, therefore, selected from the report such evidence as bears directly upon the textile trades.

Mr. Henry Mitchell, a Bradford merchant, and a member of the local chamber of commerce, spoke of the diminution of trade with Germany, and with the United States. Bradford industries were not so depressed as they were a year or two ago, though the effect of fashion had been unfavourable to Bradford and in favour of France. The latter country had the advantage in hours of labour, rates of wages, and technical education, but Bradford manufacturers were making an effort in this last matter.—Mr. Samuel Andrew, secretary to the Oldham Master Cotton Spinners' Association, and Mr. Samuel Taylor, a millowner at Oldham, gave evidence regarding the very depressed condition of the cotton trade, which had been felt since 1875, and there had been no increase of trade in any direction. The fall in the exchange of silver had had a good deal to do with the depression. Foreign competition had increased in our colonies, but not to any great extent in the home trade. There had been over production in the cotton trade.—Mr. James B. Brown, a tweed manufacturer at Selkirk, stated that the depression in the tweed trade consisted in a falling-off in volume, value, and profit, and was shared equally by the home and the foreign trade. While there was general depression in the South of Scotland, there were slight indications of recovery in trade.—Mr. Thomas Stuttard, of the firm of James Stuttard and Sons, cotton manufacturers, testified that there was general depression in the cotton trade as well as a greater falling-off in the home demand than in the foreign. He was in favour of duties on foreign manufactures.—Mr. James Mawdsley, secretary of the Amalgamated Association of Operative Cotton Spinners, said the proportion of the unemployed was much larger now than it was ten years ago, the depression consisting in lack of employment for labour and of profit for capital. The present depression was not greater than previous depressions.—Mr. George Lord, of the Manchester Chamber of Commerce, said there was some prospect of a revival in the cotton trade. He thought the Government departments ought to be more closely allied to the commercial community.—Mr. William Schulze, a woollen manufacturer and merchant at Galashiels, stated that the present position of the woollen trade was very bad. There were no profits, and there was a considerable falling off in the demand. He thought we ought to try and reduce the nation's tariffs by retaliation, only, however, when the opportunity arose, and it would need to be done very judiciously.—Mr. Albert Simpson, spinner, &c., Preston, testified that the condition of the cotton trade was exceedingly bad, and suggested that there should be import duties on foreign manufactured goods.—Mr. Joshua Rawlins, secretary to the North and North East Lancashire Cotton Spinners' Association, said that the cotton trade had been very much depressed. There had been over-production, but he thought England could hold her own against foreign competition.—Mr. S. Henriksen, a Manchester merchant, said the cotton trade had been depressed for five or six years, but there were signs of improvement. There was no country that could compete with us in staple goods.—Mr. J. H. Walker, Mr. J. J. Weanberg, and Mr. A. Henderson, all connected with the Dundee Chamber of Commerce, gave evidence with reference to the jute trade, which was unsatisfactory. The flax trade had, to a large extent, left Dundee, to which town it had always done good.—Sir Jacob Behrens, of Bradford, stated that the wool trade could not be called depressed. Bradford spinners were now better able to meet demands for both hard and soft yarns. There had been a decided increase of our exports to the colonies. He spoke of the need for consular assistance and the publication of information as to tariffs, &c., as well as of a permanent Trade Commission.—Mr. R. H. Reade and Mr. J. T. Richards, of Belfast, testified that the linen trade was in an unsatisfactory condition as regarded the profits of capital, but not as regarded the remuneration of labour.—Mr. Brocklehurst, M.P., of Macclesfield, said the silk industry, which was very dependent on fashion, was much depressed. He would not propose a return to protective duties, but if the silk trade was worth cultivating at all, or if it was to be cultivated as an industry to any great amount, it would have to be cultivated by protection. There was a want of technical and scientific knowledge in England, and he thought schools of art should be more widely established, and a Minister of Commerce appointed.—Mr. H. Birchrough, (silk manufacturer), Mr. D. Evans, (silk merchant and a small manufacturer), Mr. Kershaw, (silk manufacturer), Mr. John Godwin, (designer), and Mr. John Newton (silk dyer), were successively called to testify to the depression of the silk trade, as was also Mr. J. Wright, (President of the Macclesfield Chamber of Commerce), the last named stating his opinion that unless England could have free trade pure and simple, or reverted to a protective policy, the silk trade was doomed to die out in this country.—Mr. T. P. Dunkerley, manufacturer of Macclesfield, stated that though trade was depressed, he was rather sanguine as to the future, and did not think protection necessary.—Sir

James Caird was the last witness whose evidence is given in this report, and he dealt with the causes and extent of the depression in agriculture. Seven members of the Nottingham Chamber of Commerce next gave evidence as to the effects upon the lace and hosiery trades of foreign competition and protective tariffs. They also spoke of the excessive charges for internal transport. In the appendix are given further answers which had been received from chambers of commerce, societies representing the interests of the working classes, and other bodies, in reply to the questions addressed to them by the Commissioners, and also a series of reports on the state of trade in foreign countries, which had been received from Her Majesty's representatives abroad.

## The Franco-Chinese Treaty and British Trade.

The effect of the commercial treaty between France and China, signed at Tientsin last week, upon British trade, deserves careful attention, and it is satisfactory to see, from the correspondence recently laid before Parliament, that the Foreign Office kept an exceedingly sharp eye on every turn of the negotiations, and acted once or twice with what appears decisive effect. The treaty lays down the conditions under which trade is in future to be carried on across the Tonquin frontier. Tonquin borders on the wealthiest and most populous provinces of China, Kwang-tung and Kwangsi. In the north-west, indeed, it also touches Yunnan, but the latter province is too remote and inaccessible to be taken into account at present. The inhabitants of the two first-mentioned provinces are noted for their enterprising character and for their commercial instincts. Nine-tenths of the Chinese abroad, whether in our own Straits Settlements or in Australasia, or in the United States, come from Kwang-tung and Kwangsi. Hitherto these markets have been supplied from Hong Kong by way of Canton, or the goods are sent down the coast to Pakhoi, whence they are distributed. Both can also be supplied by way of Tonquin, merchandise going up the Red River to Hanoi and Bach-ninh, and thence be taken overland by way of Langson, where they enter China. The treaty fixes the duty to be paid at the Chinese frontier for imports at one-fifth less than that levied at the maritime ports; in other words, ordinary merchandise will pay roughly 4 per cent. *ad valorem*, instead of 5 per cent. Taking into account the long land transit from the valley of the Red River to the frontier of China, in a country where the roads are bad, and where there are no draught animals, this trifling difference cannot interfere with our trade. But the French are projecting railways in all directions in Tonquin, and one of the first to be constructed will assuredly be one to Langson. This, coupled with differential duties, will certainly beget a competition in Southern China with which British merchants will have to grapple. Our centre of distribution, at Hong Kong, or Canton, or Pakoi, is quite as far from the interior of the Kwang-tung province, and from the whole of Kwangsi, as is the French centre at Hanoi, or even at Haiphong, at the mouth of the Red River. During the negotiations at Tientsin, our *Chargé d'Affaires* at Peking made a proposition which is not only excellent in itself, but is well calculated to put us on an equal footing with the French in those parts of Southern China bordering on Tonquin. He asked Lord Salisbury's permission to urge, on the Chinese Government, that the West (or Canton) River should be opened to foreign trade, and he was accordingly authorised to do so. But the matter unaccountably drops out of the correspondence, and nothing more is heard of it. The West River, rising in Yunnan, flows due west through the whole of Southern China, and enters the sea at Canton, forming a great estuary, in which Hong Kong is situated. The travels of Mr. Colquhoun and others show that it is navigable for several hundred miles through the heart of Kwang-tung and Kwangsi, and forms an unrivalled channel for trade in these regions. It would enable us to put our wares down in these provinces without any expensive overland transit, and it does not offer any of those serious obstacles to navigation, such as the rapids on the Upper Yangtze beyond Ichang. The present is a favourable opportunity—the Burmese difficulty being once out of the way—for urging the opening of this river on the Chinese. They have no desire to see the French obtain a trade monopoly in any part of their Empire, and the reduced duty on French goods, crossing the frontier, would be an argument in favour of granting the other concession. But in this, as in most other commercial matters, the Foreign Office will not move of itself; the impetus must be given by the Chambers of Commerce, and the subject is one deserving the prompt attention and decision of these bodies.



## ORIGINAL DESIGNS.

A reference to our first plate will be found on this page.

On our second plate, we give a Design for a Border for Dress Goods. These borders are now very fashionable woven in the same fabric as the dress piece. Considering that velvet is always a favourite material for the trimming of costumes, it has occurred to us that a border of broché velvet would be a taking thing in the market, to be used as a trimming for any suitable kind of dress piece. We have, therefore, given the present pattern as a Design for Broché Border for Dress Goods. It is equally suitable for stuff goods, or for printed materials, in either cotton or woollen.

On our third plate, we give a Design for a Brussels Carpet, which has been drawn by Mr. George Lees, Commercial Buildings, Kidderminster. We have endeavoured to produce this design by means of a new process, and it has not come up quite as successfully as we could have wished, still, we hope, the pattern will be clearly distinguishable by our subscribers.



**Wool.**—On the whole, a fair business has passed during the month in wools. The tone of English sorts, of the lower qualities, has been firm, with a hardening tendency in prices, whilst the finer kinds have met with rather less inquiry. The operations have only been of a hand to mouth character, there being an entire absence of speculation. Botany wools have had a slower sale, with weakening rates. Yarns have sold fairly well, Botany sorts meeting with most attention. In ordinary descriptions of worsted yarns, there is nothing new to note, the demand being about equal to the supply. Spinners keep firmly to late quotations, and, as stocks generally are low, both at home and abroad, they show no disposition to make any reduction in rates. The piece branch has improved, although the dress goods department does not show any advance. The coating and lining cloth departments have been busy, these branches being the most satisfactory in every respect. Prices are generally low, owing to various causes, the principal being the keen competition which exists.

**Cotton.**—The markets for the raw material have varied. Towards the end of the month, prices showed a hardening tendency, with the consequence that spinners held out for advanced rates for yarns, but with little success, as the production still exceeds the consumption. Perhaps, the worst department of the market is that of export yarns, for which the demand has not improved in any degree, and the signs of amendment are very few. Manufacturers of goods for the home trade have only bought to cover actual requirements, as they can immediately lay their hands on any description of yarns wanted. The cloth branches, with the exception of shirtings, have improved. In dhooties, mulls, jaconets, and such like goods, there has been more doing, and some good contracts have been placed, of a fairly satisfactory nature to manufacturers. Shirtings are to be had in abundance, with a consequent reduction in prices. Heavy goods have remained unchanged. The thinner kinds of printing cloths have met with moderate attention, but the heavier sorts have been neglected.

**Woollen.**—Trade in this branch has varied in different districts. In the Leeds and Huddersfield markets, the better class of worsteds has met with most attention, and seems likely to keep a hold for some time to come. Manufacturers of this class are now offering cloths of a superior kind, and, on the whole, orders for next season are coming in fairly well, at moderately remunerative prices. In the medium qualities of worsteds, the business done has not been brisk, although some good patterns have been offered. The lower qualities, of a backed nature, have sold moderately well, but at prices not quite satisfactory to the maker. In the heavy woollen trade, business has assumed a more cheerful aspect, and orders of a larger volume are expected during the month. In tweeds, those of a

cheap, showy character have been in most favour, and a fairly good business has been done. The colourings, in some of these cloths, are of a more effective nature than formerly, and their general finish contributes, in no small degree, to their selling capabilities. The better classes of tweeds have also met with fair attention, and hopes are entertained that, from patterns now being sent out by manufacturers, considerable orders will be received. The medium qualities do not meet with the demand experienced by better and lower descriptions, and are thus affected somewhat in prices.

**Linen.**—Business, generally, has shown no signs of improvement, having remained much in the same condition as reported in our last issue. With a few exceptions, goods have only had a moderate demand, but prices have remained steady. The demand for damasks of various kinds has been fair, but there are still large quantities on the market, which prevent any advance in rates. Flax has ruled steadier, both in demand and price, owing to imports being lower in volume. In jute, there is no great improvement to note.

**Lace.**—This branch of industry has shown signs of improvement, the demand for many classes of goods having increased, prices have had a hardening tendency. Bobbin nets have had a fair average demand, whilst the orders for curtain and window blind nets have been satisfactory. The silk branch has had a rather restricted inquiry, and the demand has been quieter. Irish and other crochet edges and laces have improved, both in demand and prices. The curtain branch is still unsatisfactory, as many machines are still idle, and there seems little prospect of an early improvement.

### EMINENT TEXTILE MEN. No. 1.

#### The Late Right Hon. W. E. Forster, M.P.

We give, on our first plate, a photograph of the late Right Hon. W. E. Forster, M.P. for the Central Division of Bradford. In doing this, we wish it to be distinctly understood that it bears no political significance. We are wishful, only, to pay a tribute of respect to one, amongst the many, textile manufacturers who have, from various causes, won for themselves a name. In the earlier years of his career, Mr. Forster was in business as a wool merchant, but retired from that trade to take up the manufacturing of what is generally known as Bradford goods. First commencing in Bradford, under the name of Fison and Forster, the business of the firm rapidly extended, until it was deemed necessary to make extensive enlargements. The business was, therefore, removed to Burley-in-Wharfedale, where it has ever since being located. With Mr. Forster's parliamentary career, we do not intend to deal, as we take no sides in politics. Mr. Forster will long be remembered by his visit of enquiry to Ireland, during the time of the famine, and by the assistance which he was, in a great degree, instrumental in giving to the sufferers in those days. The Right Hon. gentlemen was a Fellow of the Royal Society, and held the honorary distinction of L.L.D. from the University of Aberdeen, and also that of D.C.L. from the University of Oxford. He was a Magistrate and Deputy Lieutenant for the West Riding of Yorkshire. He took an interest in the Volunteers, having held a Captaincy in the 23rd West Riding Regiment of Volunteers. In 1875, he held the office of Lord Rector of the University of Aberdeen. He married, in 1850, the eldest daughter of the well known Dr. Arnold, of Rugby, but leaves no children.

#### Commercial Failures.

According to *Kemp's Mercantile Gazette*, the number of Failures in England and Wales gazetted during the four weeks ending Saturday, April 24th, was 427. The number in the corresponding four weeks of last year was 334, showing an increase of 93, being a net increase, in 1886, to date, of 200. The number of Bills of Sale published in England and Wales for the four weeks ending Saturday, April 24th, was 1,074. The number in the corresponding four weeks of last year was 923, showing an increase of 151, being a net increase, in 1886, to date, of 225. The number published in Ireland for the same four weeks was 96. The number in the corresponding four weeks of last year was 61, showing an increase of 35, being a net increase, in 1886, to date, of 81.



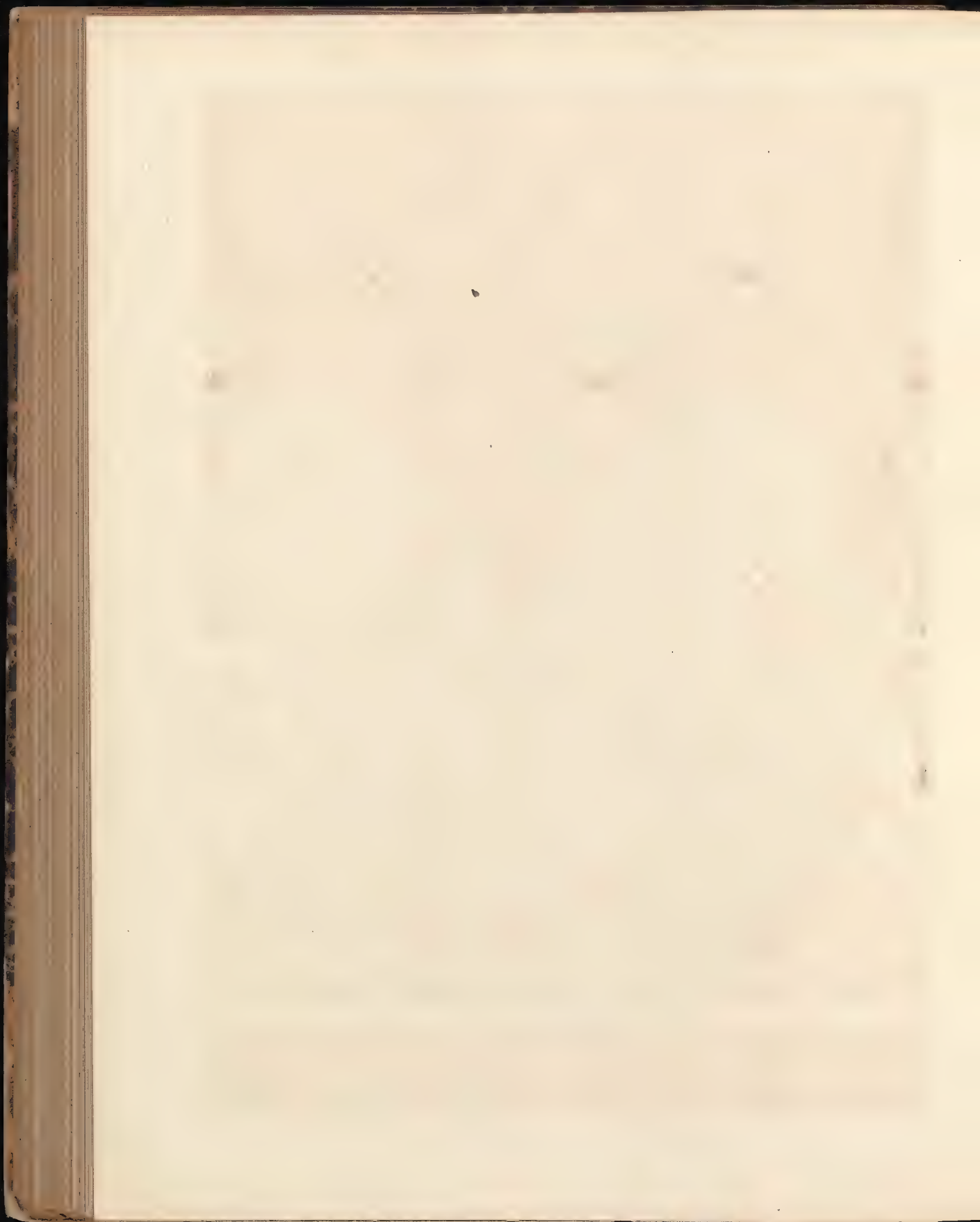
May 12th, 1886.

THE JOURNAL OF FABRICS AND TEXTILE INDUSTRIES.



ALBERT SACHS, PHOTO. LITHO

EMINENT TEXTILE MEN.  
No. 1.—THE RIGHT HON. W. E. FORSTER, M.P.





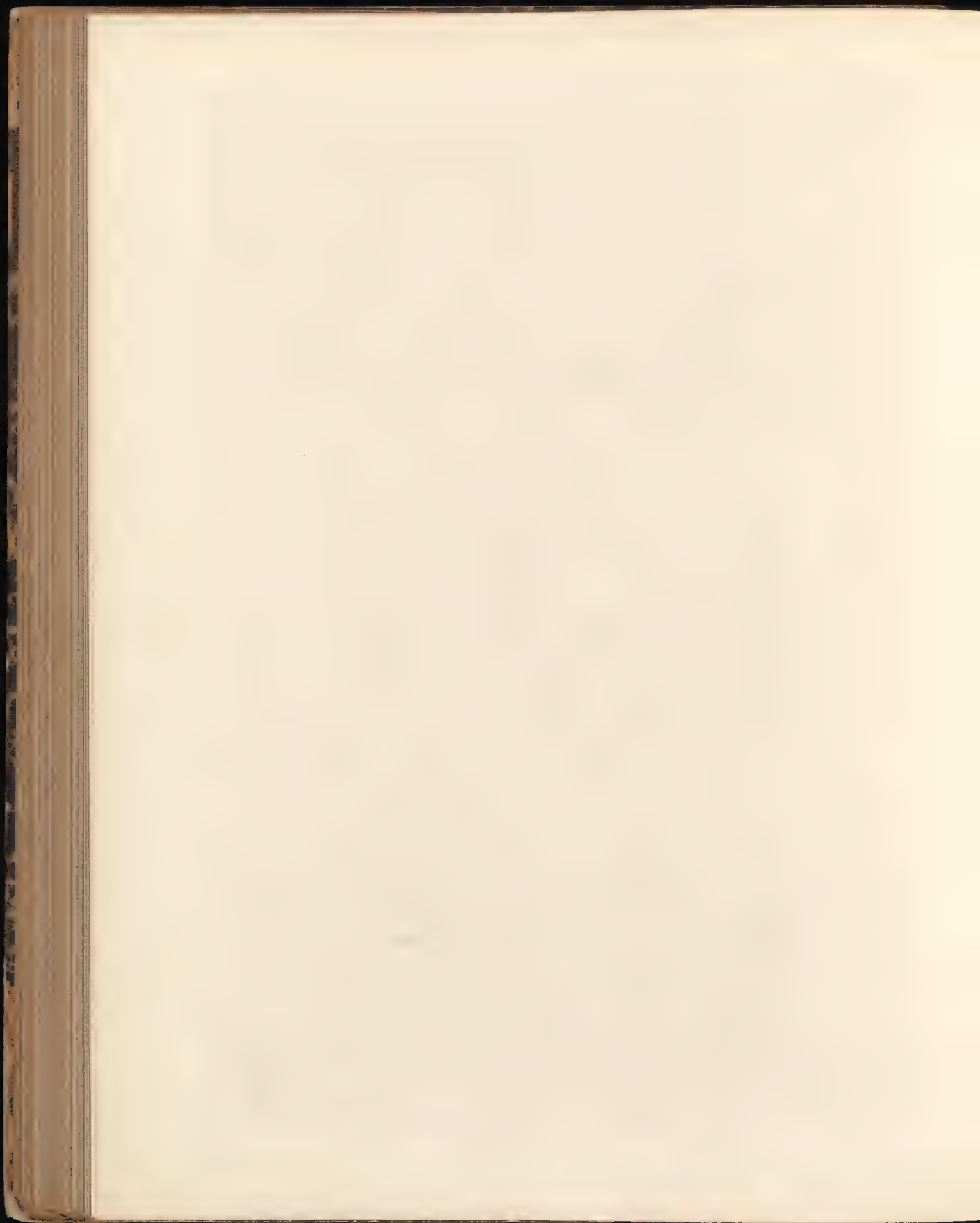
THE JOURNAL OF FABRICS AND TEXTILE INDUSTRIES.

12TH MAY, 1886.

DESIGNED BY R. T. LORD.



BROCHE BORDER FOR DRESS GOODS.





THE JOURNAL OF FABRICS & TEXTILE INDUSTRIES.

12TH MAY, 1886.

DESIGNED BY GEORGE LEES.



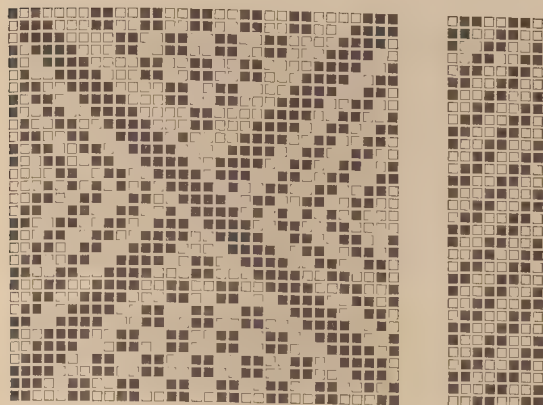
BRUSSELS CARPET.





## Manile Cloths.

No. 356.



No. 1.

No. 2.

Warp:—

Weft:—

12 White }  
 12 Plum } 132  
 12 White }  
 12 Black }  
 2 Orange Silk  
 2 Black  
 2 White }  
 2 Plum } 16  
 2 White }  
 2 Black }  
 6 White }  
 6 Plum } 114  
 6 White }  
 6 Black }  
 4 Orange Silk  
 2 Black  
 2 White }  
 2 Plum } 16  
 2 White }  
 2 Black }

Bright Yellow Fawn.  
 Bright Indigo Blue.  
 Myrtle Green.  
 Scarlet Silk.

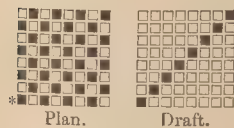
4800 ends.  
 78 picks per inch.  
 4 ends in a reed.  
 60 inches wide in the loom.

2/84s worsted.  
 2/30s silk.

Two Pegging Plans for this Pattern.  
 Both can be used.

No. 357.

Warp:—



Plan.

Draft.

Weft:—

2400 ends.

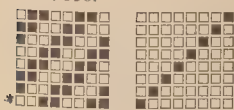
14 Blue Lavender }  
 1 Claret } 78  
 1 Crimson Silk }

2 White, Orange and Green Silk }  
 3/14s silk.  
 3/30s silk. Soft twine.

## Tweeds.

No. 358.

Warp:—



Plan.

Draft.

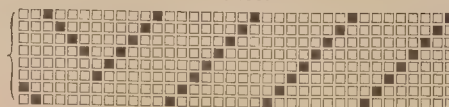
13 Black.  
 2 Ruby.  
 1 Crimson and Green.

19 skeins woollen.  
 40 skeins woollen twisted.

2,300 ends.  
 33 picks per inch.  
 4 ends in a reed.  
 72 inches wide in the loom.  
 56 " " when finished.  
 Natural finish.

Weft:—  
 13 Dark Bottle Green.  
 2 Rich Bronze.  
 1 Black and Blue.

No. 359.



Draft.



Pegging Plan.

Warp:—

Weft:—

28 skeins woollen twisted.

6 Black.

Brown.

1 Scarlet.

Scarlet.

2,160 ends.

4 Cream.

Red Fawn.

32 picks per inch.

1 Scarlet.

Blue Green.

4 ends in a reed.

6 Black.

Blue.

70 inches wide in the loom.

1 Blue.

4 Cream.

56 " " when finished.

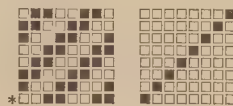
1 Blue.

Nice soft finish, short pile.

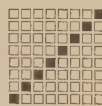
## Cheviots.

No. 360.

Warp:—



Plan.



Draft.

1100 ends.  
 33 picks per inch.  
 4 ends in reed.

66 inches wide in the loom.  
 56 inches wide when finished.  
 17 skeins cheviot.

13 Lt. Steel Mixture, 3 Red Fawn,  
 rich colour.

Weft:—  
 13 Brown and White Mixture, 3  
 Red Olive Brown.

No. 361. Same Plan and Draft as No. 360.

Weft:—

Warp:—

1 Black and Scarlet.  
 6 Black.  
 1 Black and Scarlet.  
 4 Old Gold.

1 Black and Orange.  
 6 Mulberry.  
 1 Black and Orange.  
 4 Old Gold.

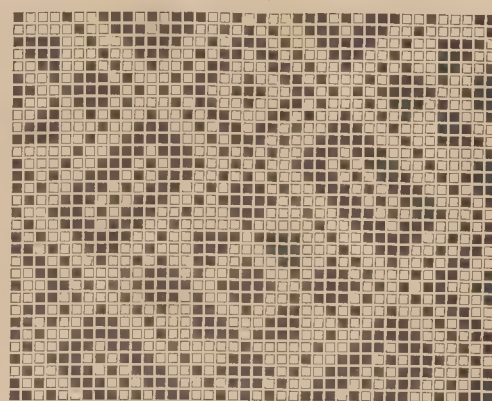
Introduce Bright Mohair loop into every third check, two ends.

1020 ends.  
 30 picks per inch.  
 4 end in a reed.

34 inches wide in the loom.  
 11 skeins cheviot.  
 Fancies, 22 skeins twisted.

## Press Goods.

No. 362.

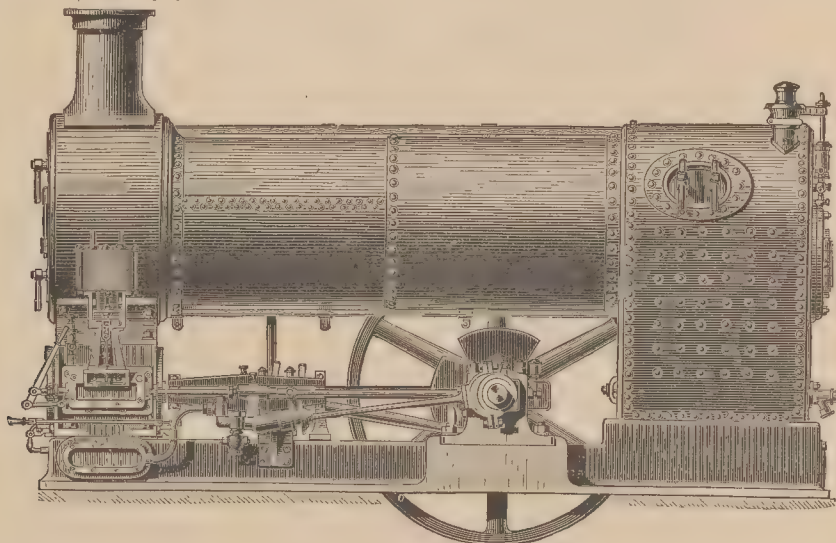


Design.



### "Richardson-Neville" Electric Regulator.

Some interesting electrical experiments were carried out recently at Muncaster Castle (by the kind permission of Lord Muncaster), in the presence of a number of scientific gentlemen, and others interested in Electric Lighting. The experiments (which were highly successful) were made to test the efficiency of the "Richardson-Neville" Electric Regulator, which was exhibited and described at the summer meeting of the Institute of Mechanical Engineers, held at Lincoln last August, and which was illustrated in the principal scientific papers shortly after. The installation at Muncaster Castle was made by Messrs. Edmondson, of London, the well known Electrical Engineers, and consists of two Elwell Parker Shunt Wound Machines, each capable of supporting 120 lights of 16 candle power each. The machines are driven by a steam engine of 14 h. p. nominal, made by Messrs. Robey and Co., of Lincoln. It has two cylinders, 8½ inches diameter, by 14 inches stroke, fixed on a massive cast-iron base plate, which also supports the boiler, and is of the type now so well known as the "Robey Engine." There are, further, 50 secondary batteries, which are charged by the dynamo, so as to avoid the necessity of running the engine late at night, or on Sundays. The engine is not only used for electric lighting but, also, for sawing wood for the estate, for which purpose, it is fitted with an ordinary



Steam Engine with "Richardson-Neville" Electric Regulator attached.

high speed governor, controlling a double beat valve. When used for electric light purposes, this governor does not come into play, the engine being controlled entirely by the Richardson-Neville Electric Regulator. A high testimony to the value of the apparatus lies in the fact that though it was set to work over six months ago, and was left in the hands of an ordinary engine driver, it has continued to work most satisfactorily, and was found, by the gentlemen who made the tests, in a state of the highest efficiency. Among those present were the representatives of the *Engineer*, the *Electrician*, the *Electrical Review*, and *Mechanical World*. The tests made were as follows:—The engine was started, running the dynamo with one lamp only burning in the engine room. A man was then sent round the castle to turn up the lights, as would be done in ordinary use, while the volt meter was carefully watched to see the effect upon the electro motive force—this remained constant at 120 volts—it being impossible to detect the slightest variation. The engine, as the lamps were turned on, increased in power and speed, the intensity of each light remaining absolutely constant. Groups of lights on the brackets and electroliers,—in tens, twenties, and thirties, were turned in and out without making any perceptible change in the electro motive force. A most severe test, probably the most severe possible, was then tried. All the lights which could be lighted were turned on, and, by a switch in the engine house, all turned off at once. Simultaneously with turning the switch, the click of the slide valve was heard in the steam chest, showing conclusively that all the steam had been shut off, and that the engine was running empty. Examination of the volt meter, before and after, showed no difference in the E.M.F. When all the lights were turned on, the effect on the engine was equally instantaneous. The experiments were many times repeated, always with the same results. It is certain that a momentary change must really take place, when large numbers of lamps are switched in or out, else no effect could be produced upon the engine, for "out of nothing, nothing can come."

To ascertain this amount was the next object. The volt meter was kept in the circuit, and carefully watched by one gentleman, another as carefully observing the time, whilst a third manipulated the switch. A signal being given, the lamps on all switched out, the volt meter needle was seen to make a sudden upward movement, instantaneously to change its direction, and to come gradually to rest again. The maximum variation, and that only for an instant, was not more than 5%, and the whole time occupied by the regulator in shutting off steam from the engine, and bringing the E.M.F. to its normal intensity, did not exceed three seconds—the speed of the engine being reduced from 143 to 123 revolutions within that time. Similar experiments were then tried with the accumulators, with equally satisfactory results. The next test was made to show how far the boiler pressure could be raised without affecting the speed of the engine, the load remaining constant. Steam was allowed to run down from 75 to 40 lbs. pressure, and to run again to 80 lbs.; the speed of the engine remaining constant within one revolution. It was remarked that though the regulator acted with most remarkable promptitude or suddenness, there was not the slightest tendency to overrun or hunt. After making the foregoing test, the party were conducted round the castle, and admired the very excellent effect of the electric light in the various rooms and passages. Owing to the fact that a number of workmen were employed decorating some of the rooms, the whole number of lights was not in position, but much admiration was expressed for the very beautiful electroliers in the library, made of polished copper, in the form of sprays and flowers, in each of which is a glow lamp. These are arranged with their switches, so that one-third, two-thirds, or the whole number, can be lighted at once. The effect was most beautiful. The electroliers, together with most of the fittings, were made by Messrs. Edmondson and Co., from designs by Mr. Ferguson, the architect to the castle. It has often been remarked that an objection to the electric light is

the amount of machinery required, the great space needed, and the necessity of skilled workmen to attend to it. Anyone, however, who has seen a small gas works with its hideous holder, its dirt, and abominable smell, and who then compares it with the small, compact engine-house, with the beautiful bright machinery, running as this was, almost without sound, must be convinced that, of the two, the electric light is infinitely to be preferred, and, as has been previously stated, one man attends to the whole, occasionally leaving it for about half an hour to attend to itself. Messrs. Edmondson and Co., and Messrs. Robey and Co. are to be congratulated upon the perfect working of the machinery. The whole of the installation is a most complete success, and may well serve as a model for others of a similar character.

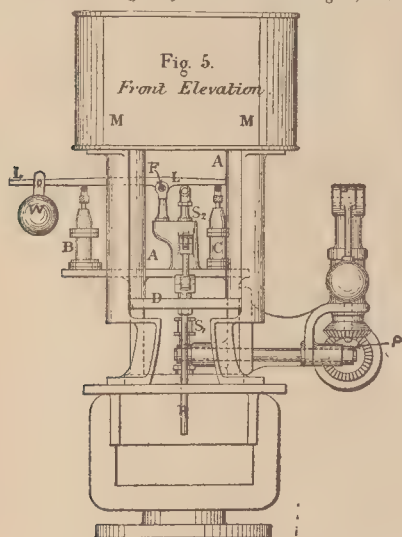
### The Proell Automatic Expansion Gear and its Application to New and Existing Engines.\*

(Concluded from Page 32.)

From indicator diagrams, which were taken from a condensing engine of this type, with a cylinder 23in. by 42in., made by Messrs Robey & Co., of Lincoln (see illustration on page 33), and driving a London guano works, the action of the gear is as perfect in regard to the admission line as can be produced by the most elaborate and complicated mechanism; and yet this result is obtained by only five moving parts, which constitute the gear proper. To show the amount of wear to which these parts are subjected, a cut off piece, which has to bear the heaviest strains of the whole mechanism, is before the meeting, which has been continuously working for four months. That wear which is now visible on the same made its appearance after a few



days, and has never since increased. Very likely it has its cause in the hardened steel face having been left black instead of being ground bright. Wherever the latter course has been adopted, no wear whatever has been shown after long work. This may be attributed to the fact that the trip action is such that even when the governor is high up, and the steel faces meet for a very short contact only, still there is a wide and substantial surface on which the strain is distributed. No case has, so far, come to the inventor's knowledge where the steel faces have worn out, although there are engines running which have been at work for four years; but even in case there should be so much wear in time that the governor should no longer compensate it with ease, then the faces can, at the cost of a few pence, be renewed in a few minutes. Most of what has been said about the application of the system to new engines, refers to its application to existing engines as well. The construction of the apparatus remains nearly the same, with the following modifications:—The lifting levers, instead of extending outwards, and acting on two independent valves, extend inwards, and act on one and the same valve; the separate air-buffers are combined in one, *l*, which is arranged in the centre of the apparatus; the closing springs, instead of being placed above each separate valve, are coiled round the shafts of the lifting levers, and the equilibrium valve itself is enclosed in a suitable case, with flanges for the steam passage. By this transformation, the apparatus has become self-contained, and includes everything that is required to convert a slide valve engine, governed by throttling, into an automatic expansion, or Corliss engine. All that remains to be done to complete the conversion is to fix the apparatus on the steam chest, to connect the oscillating lever with an eccentric on the shaft, and to drive the governor by a belt or gearing at its required speed. It will be understood that in this way the expansion valve beats twice during every revolution of the engine, leaving the distribution of



Robey and Co.'s Combined Electrical and Centrifugal Governor.

the steam, above or below the piston, to the action of the slide valve, except as regards the cut off. Thus the engine remains entirely as it was before, only, instead of the throttle valve case, the expansion valve case is inserted, and in many cases the dimensions of the two are so much alike that the old steam connections may be used again. With due preparation, such conversions have been effected in a few hours, and the results in regularity of speed and saving of steam, have, in every case, been most remarkable. The self-contained character of the apparatus has the further advantage, that any maker may build a new engine after his own patterns, with perhaps trifling alterations, which enable his engine to take the gear, which latter he may buy ready-made. Thus, that most difficult part of the modern engine—the expansion gear—becomes a marketable article, about the manufacture of which an engineer need take no trouble; and as the gear in this form can be made wholesale and in standard sizes, it can, by the makers, be furnished at a cheaper price than the manufacturer of an occasional expansion engine would be able to design and to build a, perhaps, doubtful gear for himself. From different indicator diagrams taken, they clearly show the effect which the governor has on a throttle engine, and the different shapes, obtained before, and after, the application, may be left to speak for themselves. The saving in steam effected in different installations ranges from 10 to 35 per cent. Of one installation, diagrams from a Moscrop recorder, before and after fixing the Proell apparatus, have been taken. It was a McNaught Beam engine—high pressure cylinder 38 in. diameter, 39 in. stroke, low pressure cylinder 42 in. diameter, 72 in. stroke—running at a speed of 32 revolutions per minute, and indicating, on an average, 250 H.P. Considering that the engine was never originally intended for Proell gear, the Moscrop Diagrams were very satisfactory ones, while the other showed intermittent variations. These latter were caused by the engine being at regular intervals loaded beyond the fair

limit of its fly-wheel power; and although the diagram widens during those periods, there is no indication of unsteady running of the engine with regard to the number of revolutions during a minute, or even to the duration of every single stroke; but only of a regular variation of speed within every single stroke, owing to insufficient storage power of the fly-wheel. It was, however, observed that the apparatus even in this case had perfectly succeeded in preventing the engine from exceeding its speed at any time, which the throttle valve was entirely unable to do, as shown in Moscrop Diagrams, taken before the application of the Proell apparatus, where the action of the throttle had to be continually supplemented by the driver working the stop valve. This latter is now never touched after the engine is started, and is continually quite open. The saving in steam in this installation, by the application of the apparatus, has been proved to be about 17 per cent., which, considering the large dimensions of the engine, insures the return of the money spent within about six months, not calculating the great advantages accrued from the perfect governing of the engine. There are two different ways of connecting the apparatus with engines of this style. The rocking lever A may either receive its motion from the existing slide valve eccentric, or a special eccentric may be provided. In the first case the ratio of cut off can be altered by the apparatus within the limits of 0 to 0.4, in the latter from 0 to 0.75, and different advance angles are chosen in each case. By choking the air-buffer, and thereby retarding the falling of the valve, steam can be carried nearly to the end of the stroke, or as far as the slide valve will allow it. The adjustment of the gear for equal lead or for correct balancing of the engine is a matter of the greatest ease, and is facilitated by the possibility of indicating the steam chest between the expansion valve and the slide as, with the exception of the exhaust lines, both diagrams from the ends of the cylinder are faithfully given. Thus it is sufficient to secure one indicator only on the steam chest. Should the cut off not turn out alike within narrow limits,

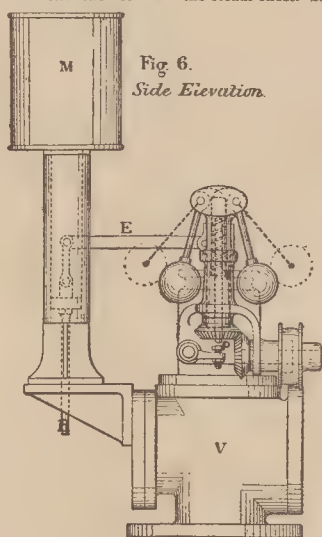


Fig. 6. Side Elevation.

for both sides of the cylinder, a lengthening or shortening of the apparatus eccentric rod (for which purpose a right and left hand screw adjustment is provided) will set this matter right. The proper lead in the admission of steam is attained in an equally simple manner, by a screw adjustment in the air-buffer, by which the valve spindle is lengthened or shortened, and thus the steel faces of the lifters are raised or depressed, determining the moment of attack of the bell cranks on the lifters at an earlier or later period as may be required by the circumstances. As the quantity of steam admitted to the cylinder depends on the high or low position of the governor rod, it will be seen that by adjusting this rod in relation to the mean position of the governor, a ready means is given for adapting the apparatus to control engines of any abnormal properties. For instance, if an engine is at times overloaded, and not liable to race when overcoming friction only, the rod may with advantage be adjusted so low, that in the lowest position of the governor, the valve is not released at all, but is alternately kept open by the two bell cranks, so that the cut off, as well as the steam admission, in this abnormal case, is effected by the slide valve only, and then the engine will give out its maximum possible power, and even overcome excessive work with regularity. As soon as this work leaves the engine, the governor will at once rise, and the expansion gear, which had been inactive, will come into action again. On the other hand, in lightly loaded engines, especially of the compound type, it frequently happens that the admission of just only enough steam to produce a vacuum in the low pressure cylinder will be sufficient to make the engine race. In some cases, the services of the Proell apparatus have been found

very valuable, as the governor rod can be set so high that the governor, already before attaining its highest position, entirely withdraws the opposite steel faces from one another, so that, for the time being, the expansion valve remains entirely shut until, by the consumption of the fly-wheel inertia, or by fresh work coming on the engine, the governor is induced to fall, and fresh steam is admitted to the cylinder. Among other consequences which arise from the simplicity of the gear, only one more may be mentioned. Many devices have been used to stop engines suddenly in cases of emergencies, and such arrangements will be found most useful if the stopping can be effected from any spot in the works where an accident may have happened. Electricity is, of course, the most effectual agent in such cases, and it will be seen that the Proell gear lends itself very well to its services. A two-armed lever, having its turning point in the governor stand, has, at its inner end, a fork so arranged that if the outer end is depressed by a weight or spring, the forked end goes up and raises the tail ends of the bell cranks, for which purpose, as we have seen, a very small power is sufficient. Ordinarily, the lever is kept in position by a catch, which, however, by an electro magnet can be released by closing a current with a push in any part of the factory, and the engine will then stop almost instantaneously, the steam being as securely shut off as if the stop valve had been screwed down.

We learn from the *Nottingham Journal*, that a Nottingham lace manufacturer has decided upon removing his business to Southwell, owing to the interference of the Trades Unions in Nottingham. As the population of Southwell has for many years shown a steady decrease, the introduction of this business into their midst—entailing, we hear, the expenditure of between £8,000 and £10,000 in wages annually—will be hailed with satisfaction, and will be the commencement of an activity that Southwell has never yet experienced.

\* In the preceding portion of this article, we omitted to state that the matter was reprinted, by permission of the Council, from the transactions of the Mining Institute of Scotland.





### The Indian and Colonial Exhibition.

The opening ceremony, in connection with the Indian and Colonial Exhibition, at South Kensington, was performed on May 4th, by Her Majesty, the Queen. The building is the same in which the Fisheries, and Health, and Inventions Exhibitions were held. Taken as a gigantic show, the present exhibition will, perhaps, fully equal its predecessors above mentioned; but we must confess ourselves disappointed in one or two particulars connected with the textile trades. Much has been said, at various times, of the simple and rude appliances, used by the natives of India, in the production of their beautiful fabrics. Taking an Indian rug as an instance, we might have expected to see the various processes—or, at least, one or two of them—in the making of rugs, practically illustrated. But in this we were disappointed. One or two native looms, with the natives operating them, would have been of great interest. A similar remark may apply to the various exhibits of our other Colonies. The exhibition is solely confined to manufactured products, raw materials, and such like things. Perhaps the section which will meet with most favour is that devoted to our Indian Empire, and this is quite representative, excepting the omission noticed above. What mostly concerns us, and that which mostly gained our admiration, was a magnificent display of Indian fabrics, which, in point of numbers, no less than in variety, are remarkable. Carpets, rugs, silk and cotton goods, are all well represented, specimens of the two former classes being very numerous. The main entrance hall is at once striking as a skilful arrangement of fabrics of purely Indian character, whilst in some other portions of the building, similar treatment has been employed. The cloths used for this purpose are of cotton, and are printed in elegant designs and harmonious colourings. These cloths are such as are now so popular amongst a numerous class, as curtain materials, some really artistic productions being now upon the market, at from 5s. to 7s. per pair. In another portion of the building is a splendid display of Indian silks. Canada is well represented with her textile fabrics, some of the firms there having sent good displays of their productions. We are, however, of opinion that in some of these there is room for great advancement, before classing them with our home productions, still, for a Colony so young in manufacture, all praise is due to the efforts they have made to turn out taking materials. Of wools from Australia, there is a fine collection, which, we have no doubt, will be of great interest to those textile men who pay a visit to the exhibition. As will be supposed, there are some novel features connected with some of the displays, notably amongst various fibres. The rhea, or ramie, is one which has, for some time, made a gallant struggle to come to the front amongst other textile materials, and we have often published information relating to it. It was, therefore, pleasant to notice an exhibit of this class along with a large variety of fabrics, in the making of which this material had been employed, and these, we are sure, will amply repay inspection, as they show that in the future the rhea is likely to be of no small importance in the manufacturing world. There are many other features in the exhibition worthy of notice, but it is impossible to do full justice to the subject in the limited space at our disposal. We should advise those of our friends visiting London to spend one or two evenings at the Indian and Colonial Exhibition as a pleasant and instructive way of disposing of time.

Mr. John Jardine, of Nottingham, writes to us as follows:—Will you allow me to point out that your special Trade Commissioner's remarks, in issue of April 12th, to the effect that "Foreigners now, instead of buying English machinery to any extent, make it for themselves at much lower rates than they can purchase it in 'this country,' is wrong—altogether wrong. In the first place, no complete levers, or curtain lace machines, are made outside the Borough of Nottingham. In the second place, such of the rougher and simpler parts of the lace machine as are made abroad, are not only inferior in quality, but higher in price; and, finally, I export more than four times as many of the very parts that are made abroad as the total foreign production.

### A Manufacturer on Arbitration.

Mr. Andrew Carnegie, the great manufacturer, has contributed a letter to *The Forum*, in which he takes strong ground against lock-outs and strikes, and says that there is no excuse for a strike or a lock-out until arbitration of differences has been offered by one and refused by the other. He favours a plan by which the men will receive high wages, when their employers are receiving high prices for their product, and suggests that wages should be based upon a sliding scale in proportion to the net prices received for the product from month to month. While Mr. Carnegie speaks favourably of co-operation, he dismisses that part of his subject, by saying it is not within measurable distance. Mr. Carnegie suggests the following remedy:—First—That compensation be paid the men, based upon a sliding scale, in proportion to the prices received for the product. Second—That a proper organisation of the men be made, by which the natural leaders will eventually come to the front and confer freely with the employers. Third—That peaceful arbitration be, in all cases, resorted to for the settlement of differences which the owners and the mill committee cannot themselves adjust in friendly conference. Fourth—That no interruption ever occur to the operations of the establishment, since the decision of the arbitrators will take effect from the date of reference. If these measures were adopted by an establishment, several important advantages would be gained. First—The employer and employed would simultaneously share their prosperity or adversity with each other. The scale once settled, the feeling of antagonism would be gone, and a feeling of mutuality would ensue. Second—There could be neither strike nor lock-out, since both parties had agreed to abide a forthcoming decision of disputed points. Knowing that, as a last resort, strangers were to be called in to decide what should be a family affair, the cases would, indeed, be few which would not be amicably adjusted by the original parties, without calling in others to judge between them. Whatever the future may have in store for labour, and no evolutionist who sees nothing but certain and steady progress for the race will attempt to set a boundary for its triumphs, I am persuaded that the next step forward is to be in the direction I have here ventured to point out, and which I have done as one who is most anxious to contribute his part towards helping forward the day of amicable relation between the two forces of capital and labour, which are not enemies, but are really auxiliaries, who stand or fall together. I ask, at the hands of both capital and labour, a careful consideration of these views.

### British Consuls Abroad.

The discussion which has been taking place recently in the English press, as to the appointment of foreigners to English Consularships in Germany, has been watched with much interest by the heads of English business houses established upon the Continent. Commercial men hail with delight Mr. McLaren's action in the House of Commons, and it is felt that he is doing good service for the industrial interests of our country by directing attention to the unsatisfactory manner in which British commerce is looked after in Continental cities. In spite of all assertions to the contrary, those of us whose lot has cast them in many lands, cannot fail to have observed the enterprise, determination, and energy for affairs that characterise the German race, and there is, undoubtedly, much truth in the admission made by Mr. Palmer, the other evening, that "Germany is one of the most prosperous countries in Europe." That great nation is making large strides in the foreign markets of the world, and she is rapidly becoming, if she has not already actually become, our most formidable competitor and commercial rival wherever business men do congregate throughout the entire world. The commercial element abroad unhesitatingly assert that this is owing to the fact that business attainments are the qualifications required in her foreign Consuls, rather than aristocratic connections and grand names. It is asserted that England has been asleep in the matter of attending to its trade interests abroad through its representatives; and if we study the formidable reports to their Governments, and the expression of carefully worded opinions as to the influences that affect trade in their respective centres, that are regularly supplied by the Consuls of the United States, we are bound to admit that our British Consuls are very often far behind those of some other nations in the attention they pay to the general interests of British trade. There is an evident need for a revision of our whole Consular system, and it is earnestly to be hoped that the present Parliament, which is so largely recruited from the ranks of those who are engaged in gigantic mercantile speculations and affairs, may have the determination to deal in a drastic manner with this most important and



long-neglected item of national policy. It is perfectly right and necessary that our Consuls should have regular office hours when they can be consulted by those who require to avail themselves of their services; and, so far as one can see, no particular inconvenience is experienced from the fact that those hours are usually not very numerous, but, taking into consideration the, by no means, insignificant salaries that are paid to many of our foreign representatives, it is felt that there are occasions when they might not unreasonably stretch a point, when, otherwise, commercial interests might seriously suffer. For instance, recently, a British Consul, in a Continental town, which shall be nameless, although he had not quitted his office, would not perform some little act of formality that would not have occupied him more than two or three minutes, simply because the merchant, who had used every possible exertion to arrive by three o'clock, arrived five minutes later. The little service he required, though of the most trivial nature in itself, was one that entailed great consequences, and despite the fact that my informant, with many expressions of apology, earnestly entreated that the Consul would grant him the favour of an interview of a few moments, and pointed to the great interests he had at stake, the naked reply was sent that "the Consul will be at his office at eleven o'clock to-morrow morning." Now, it is of this sort of thing that the merchant complains; and it is felt that if men are appointed to Consular agencies who are versed to some degree in international diplomacy, rather than in commercial knowledge, and who are possessed of no earthly interest in trade affairs, beyond receiving their fees—men who will not put themselves to the slightest inconvenience, no matter what disastrous consequences result—then British interests abroad will inevitably and eternally suffer. Unless some change for the better is speedily made, it is greatly to be feared that other enterprising European nations will, before long, chase us from the proud position we at present occupy in the van of the world's commerce.

### Power Loom for Brussels and Jacquard Velvet Carpet.

The Saxonian Loom Factory (Louis Schönherr), Chemnitz, has obtained an imperial German patent for the construction of a loom for weaving smyrna carpets, and as it contains several original features, we produce the description from the *Monatschrift für Textil-Industrie*. As is known, the manner in which the single pile threads are interlaced in the smyrna carpet constitutes one of its distinguishing characteristics; another feature is that any design, of an optional number of colours, can be produced, while the threads not used for the formation of the pattern do not run along, but float underneath the fabric, as is the case with carpets woven with the Jacquard mechanism. In order, therefore, to produce a weave, very closely imitating a smyrna carpet, in any other manner than by knotting in the single pile threads by hand, the following points must be observed. (1) Each individual pile thread must be so firmly interlaced with the warp and filling threads, that it is retained as firmly in the weave as the knotted-in thread of the smyrna carpet. (2) It must be possible to employ an unlimited number of threads of different colours, by uniting a suitably constructed Jacquard mechanism with the loom. (3) The threads not used for the production of a design must be disposed of in such a manner that they are not woven into the foundation of the fabric. These are the three principal conditions on which smyrna carpet weaving is based, and with which the inventor has fairly well complied in his novelty. We take the description of the mechanism from the specification of his patent. The interlacing of the pile-threads is effected as follows:—Each individual pile thread, being used in variable quantities, passes from a bobbin down through needles, which can freely slide up and down singly in a frame which shifts horizontally. After the threads have passed these needles, they run between dents of a movable comb through the dents of a stationary reed. Through the first and second dents of the stationary reed also pass the threads forming the foundation weave, which, for the purpose of their taffeta-like binding, are drawn into two heddles, in such a manner that the binding threads contained in the first dent of the reed pass through the one heddle, and those of the second dent pass through the other. The raise of these heddles, that is, the shed formed by the binding threads, must be so arranged, that the latter can never attain to the height of the dents of the comb, in order that the comb may be shifted freely above the raised binding threads. The interlacing of the knots, as well as of the plush weave, is effected as follows:—A wire, with a cutter, is introduced underneath the pile threads, and above the binding threads, by means of a wire apparatus. Next, the needles serving for the formation of the pile are lowered, one of the binding heddles is raised, and a pick is shot in. The needles situated below now rise again, while the pile threads in them are already fastened by a pick. After the raising of the pile threads, a shifting of the frame, by means of a lever and eccentric, occurs. Also the comb must participate in this displacement by means of a roller, which slides on a finger fastened to the frame, and by this shifting the needles, which heretofore stood behind the fourth dent, place themselves behind the third dents of the stationary reed, which is facilitated by the fact that the splits of the reed, forming the second dent, only reach up to the height of the shed of the binding warp. The same needles are first lowered again; therefore this time in the third dent, the same heddle rises again, and the second binding pick is shot in. When the needles have been raised again, two more picks are shot in, for establishing the foundation; at the same time, the binding threads are bound by an alternate raising of the two heddles. The pattern is produced as follows:—As stated above, the needles can be lowered singly, and the frame moving laterally, simply serves for guiding them. It is necessary, now, that the frame, in the width of the fabric, contains as many needles as the fabric has pile threads, but the frame can also contain as many needles behind each other as the design is to contain colours. Then, after introducing the wire underneath the pile threads, the particular thread of this number of threads, which is to be used at the time, is lowered,

bound in, and, in this manner, the multi-coloured design of the fabric is formed. The lowering of the single needles, corresponding to the design, is effected by the Jacquard apparatus, to the hooks of which the needles are suspended; the hooks required for forming the design are pressed back by the card, and those not wanted are retained by the stationary grate. It remains only to be explained how the weaving in of the pile threads, not required for the design, is prevented. After a number of wires have been introduced by the wire apparatus, in the manner heretofore described, and the corresponding number of pile threads have been woven over them, the apparatus will draw out the wire first woven in, and with it cut the pile. The pile threads not used for weaving, however, having been kept above by the Jacquard machine, remain loose above the wires, and would slide out by their tension when the pile had been cut. In order to prevent this, a presser roller presses firmly by spring or weight upon the woven-in wires, and in this manner firmly keeps the threads down. It need not be feared that this roller turns back, whereby the threads would slide out, as would be the case only with the threads lying above the withdrawn wire; the action of the roller upon the still firm threads works against the draft of the cut threads. The backward motion of the roller might also be prevented by a pawl and ratchet wheel. The clipped ends of the threads, not used for the pile, are afterwards removed from the fabric by brushing and by the shearing machine.

### Improvements in Mottled Yarns for Worsted Coatings, Trousersings, Mantle Cloths & Dress Goods.

The object of the invention, for which a patent has been granted to J. Dawson, Bradford, is accomplished in the following manner:—A yarn is spun from two rovings, each roving of a different colour, or black and white, or each roving may be of a different shade of mixture. These rovings may vary in thickness and colour, or in both, as desired; then two threads of this yarn, which is called mottled yarn, are twisted together with more or less twist, as may be desired or required to produce softness or hardness in the handling of the cloth, or variation in the appearance of the cloth. The two different threads, which are thus twisted together, may consist of four colours, or of four different shades of mixture, that is, two colours in each single thread, or two different shades of mixture in each single thread; or of one colour and one shade of mixture in each single thread, thus producing a yarn of four colours or shades of mixture; or two of the same single threads may be twisted together, thus producing a two-fold yarn, consisting of two colours or shades of mixture in four distinct strands; or one shade of mixture and one shade of colour may be spun together in the first mottled thread, and this thread twisted with a similar thread, thus producing a two-fold thread containing two shades of mixture, and two shades of colour in four strands; or mixtures and solid colours are blended in any proportion, so that the finished thread may contain three shades of mixture, and one shade of colour, or three shades of colour, and one shade of mixture. By this process, a more uniform and regular admixture of the colours, forming the mottled or grandrelle yarns, is produced, and, consequently, worsted cloth for coatings, trousersings, mantle cloths, and dress goods, can be produced with the warp only, for warp faced cloths, or with the weft only, for weft faced cloths, made exclusively with a yarn manufactured as described, and will be freer from the irregular and uneven diffusion of colours, resulting in cloths made from all mottled and two-fold grandrelles hitherto used in the manufacture of the before mentioned cloths.



A Vogtland correspondent reports that neither manufacturers nor workpeople have much reason to be satisfied with the present state of the embroidery trade, though as compared with last year, a slight improvement as set in. There is much complaint about the low prices at which goods have to be sold to America.

It has of late been stated that the Meiningen Bead Manufactures have gone back considerably, and that prices have fallen very much. This is not, however, the case. If the demand in isolated sorts of beads is no longer very brisk, the industry, as a whole, is well situated, and what is more, it promises to continue so.

Their Excellencies, the Lord Lieutenant of Ireland and the Countess of Aberdeen, intend, this month, giving a Garden Party at the Viceregal Lodge, to which all ladies and gentlemen who have attended Drawing-rooms and Levees this season (including those held by the late Lord Lieutenant and Countess Carnarvon) are invited, with their children. Their Excellencies desire that the gathering should assume a fancy character, the ladies, who are invited, appearing, whenever it is possible, in the garb of peasants of various nationalities, and the materials worn to be of Irish manufacture. It is also hoped that gentlemen will be attired in suits of tweed, hats of felt, and poplin ties of St. Patrick's blue, all of home production, and that both ladies and gentlemen will wear none but Irish gloves.



### Receiving Orders.

Charig, D. (trading as M. Charig and Son), 58, Fleet Street, London, woollen warehouseman and tailor.  
 Dixon, A. D., and Dixon, S. (trading as James Dixon), Quebec Street, Leeds, Yorkshire, cloth manufacturers.  
 Marriott, F., Bradford Road, Birstal, Yorkshire, woollen manufacturer.  
 Richardson, Hannah Lee (trading as W. and J. Richardson), Batley Carr, Batley, Yorkshire, woollen manufacturer.

### Adjudications of Bankruptcy.

Holmes, D., Holme Top Mill, Little Horton, Bradford, worsted spinner.  
 Hirst, S. (trading as George Hirst), 5, Quebec Street, Leeds, Yorkshire, woollen manufacturer.  
 Johnson, A., 19, Queen Street, Leek, Staffordshire, silk broker.  
 Walker, C., 4, Guildford Street, Leeds, Yorkshire, woollen merchant.

### Dissolutions of Partnership.

Elliott, W., and Apperly, J. T., Woodchester Mills, near Stroud, Gloucestershire, West of England, woollen cloth manufacturers and merchants.  
 Harvey, R. M., Knight, J., and Harvey, T. P., 58, Broad Street, Bloomsbury, London, floor cloth manufacturers.  
 Johnson, J. F., Allatt, G. R., and Johnson, L. A., Royd Croft Mills, Huddersfield, woollen manufacturers.  
 Tomlin, G., and Tomlin, J., New Basford, Nottingham, lace manufacturers.

### Dividends.

Balfe, J., and Balfe, G., Coronation Mills, South Reddish, near Stockport, cotton doublers.  
 Burkhardt, L. R., Oswald, J., and Webster, G., Peel Mills, Blackburn, Lancashire, cotton manufacturers, and at 68, Major Street, Manchester, silk merchants.  
 Dewhirst, T. and Dewhirst, E. (trading as Thomas Dewhirst), Albion Mill, Manchester Road, Bradford, Yorkshire, spinners and manufacturers, 1s., Commercial Bank Buildings.  
 Field, W., and Field, J. (trading as W. and J. Field), Skelmanthorpe and King's Head Yard, Huddersfield, fancy woollen manufacturers, 2s. 0d. (first and final), Offices of the Trustee, Ernest A. Beaumont, 24, Queen Street, Huddersfield, chartered accountant.  
 Heppingstall, L., jun., Milnsbridge, Huddersfield, dyer and bobbin manufacturer, 3s. 11d., Schofield, Son and Shaw, Accountants, Queen Street, Huddersfield.  
 Lord, R. H., Lord, J. P., and Lord, R., Nelson Mills, Bolton, Lancashire, cotton spinners.  
 Wilson, W., sen., (separate estate), 53, Gresham Street, London, silk merchant, 20s., Joseph Andrews and Co., Chartered Accountants, 7 and 8, Ironmonger Lane, Cheapside.

### PATENTS.

#### Applications for Letters Patent.

Addition to jack tricks used in twist lace machines. J. Mosley, London. 26th Mar. 4,297  
 Adjustable measuring and indicating apparatus, with marking appliances to register on twisted yarns and woven fabrics by coloured marks, letters, or figures. A. Hitchon, Accrington. 7th April 4,843  
 Actuating doffing comb of carding machines. E. Gaunt and W. Firth, Bradford. 16th April 5,296  
 Brushing machines employed in finishing blankets, &c. W. A. Sutcliffe and G. Thomas, Halifax. 26th Mar. 4,252  
 Breaking and scutching flax, &c. J. C. Mewburn, London. 7th April 4,874  
 Bobbins for cap and ring spinning and twisting frames. D. Clayton, Bradford. 24th April 5,631  
 Circular hosiery machines. B. Kerr, London. 27th Mar. 4,327  
 Cutting or severing the pile of piled fabrics. J. Farran, Manchester. 31st Mar. 4,488  
 Compressing and facilitating the winding of cotton, &c., which invention is applicable to carding-engines. J. Schofield and J. Hitchon, Rochdale. 31st Mar. 4,478  
 Cotton velvets, velveteen, &c. A. Dux, Manchester. 7th April 4,844  
 Cleaning, carding, combing, &c., fibres. R. B. Goldworthy and R. Wild, Manchester. 8th April 4,892  
 Calenders. W. Hartley, Manchester. 10th April 5,002  
 Combined oiler and illuminator for oiling machinery. T. Haslam and J. Moorcroft, Liverpool. 10th April 5,017

Carding machines. D. Proctor, jun., and H. McPherson, London. 12th April 5,068  
 Crape. H. H. Lake, London. 15th April 5,269  
 Carding-engines. J. Heginbottom, Manchester. 21st April 5,499  
 Carding-engines. W. Gawthorp, J. Reddihough, and S. Wade, Bradford. 24th April 5,632  
 Compressing brass covered rollers for wet spinning frames. J. Barbour, Belfast. 24th April 5,639  
 Cutting the pile of velvets, &c., and apparatus therefor. D. Scott, Manchester. 24th April 5,643  
 Dyeing and bleaching cotton, &c., and apparatus connected therewith. J. Y. Johnson, London. 29th Mar. 4,389  
 Driving machinery for spinning and twisting wool, &c. J. Cockcroft, Holywell Green, Halifax. 7th April 4,850  
 Dobbies or jacquards. J. Hollingworth, Halifax. 8th April 4,894  
 Ensuring uniform pressure on yarn whilst being wound on weaver's beams in tape machines. A. Hargreaves, London. 8th April 4,907  
 Flax preparing frame rubbers. A. Dawson, Ballymena. 26th Mar. 4,260  
 Flanged bobbins. J. H. Wilson and J. Greenwood, Manchester. 5th April 4,713  
 Pulling, milling, scouring and felting woollen, &c. H. Ainley and G. W. Tomlinson, London. 9th April 4,957  
 Flat carding engines. G. and E. Ashworth, Manchester. 16th April 5,309  
 Flanged bobbins. J. H. Wilson and J. Greenwood, Manchester. 22nd April 5,551  
 Facilitating the dividing of hard waste materials to be applied to carding engines. J. Schofield and J. Hitchon, Rochdale. 29th April 5,826  
 Gill-boxes. J. C. Walker, London. 3rd April 4,699  
 Iron flanges of weaver's warps and sizer's beams to a true and firm position on the beam. J. Barnes, Heywood. 26th Mar. 4,253  
 Jacquard mechanism of looms. J. Friessler, London. 28th April 5,806  
 Lubricating compound. J. L. Wade, Glasgow. 29th Mar. 4,404  
 Looms for ornamental fabrics. J. Clark and J. Whitson, Glasgow. 8th April 4,900  
 Loom shuttles. R. H. Shand and D. S. Preston, Manchester. 13th April 5,106  
 Lags for holding pins in heal machines or in twist engines. K. Jowett, Bradford. 15th April 5,274  
 Method of fastening together the ends of rim bands employed in mules and other like machines. J. Wagstaff, Halifax. 30th Mar. 4,417  
 Machines for hearth-rugs. J. Wilson, Halifax. 14th April 5,179  
 New and improved fibrous material and methods of manufacturing the same. H. Brunner, London. 19th April 5,414  
 Oldroyd's burl dyeing machines. M. Oldroyd and J. W. Hepworth, Halifax. 13th April 5,113  
 Power-loom web stop-motion. R. Ackerman and W. Shore, Banbury. 26th Mar. 4,259  
 Power-loom weaving. W. Strang, Glasgow. 5th April 4,716  
 Raising gills for raising blankets, rugs, &c. J. Walker and T. G. Beaumont, Halifax. 26th Mar. 4,258  
 Regulating the speed of machinery. J. Griffiths, Wrexham. 27th April 5,702  
 Reading in and punching designs for jacquard cards. J. Y. Johnson, London. 27th April 5,739  
 "Selvage motions combination" for the making of tape and other similar selvages for calicoes, &c. N. Cocker and B. Lees, Oldham. 7th April 4,844  
 Spring slay to looms for cotton, &c. W. Pennington, Blackburn. 8th April 4,890  
 Shuttles. J. T. Hargreaves, Skipton-in-Craven. 12th April 5,051  
 Spin silk yarn. J. H. Charley, Leeds. 22nd April 5,550  
 Stretching machines for woven fabrics. S. Walker, G. Leek, and S. Lomax, Radcliffe. 24th April 5,621  
 Shuttles. J. Royston, Accrington. 27th April 5,742  
 Singeing woven fabrics and mechanism therefor. A. D. Singer and D. Hunter, Glasgow. 28th April 5,784  
 Steeping flax, &c. P. Parsy, London. 28th April 5,790  
 Testing the moisture or damp in yarns, &c. W. Noton, Oldham. 7th April 4,836  
 Woven fabrics for linings, &c. R. Illingworth, Manchester. 15th April 5,232  
 Weighting motions of looms. H. Lomax and W. Nelson, Halifax. 19th April 5,396  
 Weft delivery motion and heald attachment in looms. G. H. Hodgson and W. Tetley, Bradford. 20th April 5,444

#### Patents Scaled.

2,898	3,222	3,819	3,966	4,103	4,221	4,655	6,193
7,178	12,552	13,129	14,835	15,459	15,590	1,707	3,355
14,826	1,323	3,561	4,852	15,375	2,311	3,628	4,096
4,291	4,350	4,393	4,445	4,560	11,109	15,906	3,685
4,107	4,439	4,546	4,561	13,546	13,044	4,792	4,794
4,060	5,409	8,105	138	202	4,622	4,804	8,907
12,782	15,175	21	264	334	4,863	5,430	104
4,015	5,464	6,503	6,800	618	2,922	4,625	4,871
5,015	5,362	5,408	5,670	15,615	670	688	



# The Journal of Fabrics AND Textile Industries.

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## Notices.

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We beg to remind our readers that the amount of our Subscription is small, and the sum a very trifling one for each recipient to pay, but when great numbers of accounts are in arrears for one or two years, the aggregate amount becomes a large sum to us; we therefore respectfully, but earnestly, ask our Subscribers for prompt payment, and also to inform us in writing when they wish to discontinue taking the *Journal*, as it is impossible for us to know without receiving such information.

## Cloth Selvages.

Nothing adds more to the appearance of a piece of cloth than a good selva. Whether the cloth is to be used by the consumer in a grey, or in some finished state, a good selva is equally a desideratum. In those countries where grey calicoes are used for clothing, without passing through the hands of tailors or dress-makers, as in European and other countries, where civilization has made more or less progress, an even, clean selva is, necessarily, of vital importance. In goods which undergo some process of finishing, before they are purchased by the consumer, the qualities required to form a perfect selva have to be considered from another standpoint. In these goods, the selvages are usually cut away when the material is being made up into a garment. Ladies, however, when purchasing dress goods, whether made of silk, wool, or cotton, would hesitate before buying from a piece of material which was bordered by even one ragged selva, rightly judging that a manufacturer, who would be content to produce cloth thus imperfectly made, could not be trusted to turn out pieces free from imperfections between the selvages. Those who are able to keep their looms, from one year's end to the next, upon one make of cloth, soon ascertain the best method of producing a sightly selva, but in these days of constant changes, many a one finds to his cost that this question is not to be lightly considered, and that he has to use no little ingenuity in order that his

pieces may all possess this most necessary quality. The ventilation of this subject, we are sure, will do our readers no harm; even those who, at present, experience no difficulty, may, by having their attention drawn to this question, glean something which, at some future period, may be found of service. It is absolutely necessary that the formation of selvages for cloth, to be used in the grey, should be considered separately. Whilst in cloth, which is used in the grey state, the appearance of the selva only has to be considered, other points have to be regarded when the material has to undergo some finishing process before being sold to the consumer. In the former, it is only necessary that the selva shall be neat and regular, not too thick and coarse, and without loops of weft disfiguring the outside edge. The selva has, of course, to be strong enough to withstand the pull of the weft, and the knocking up of the reed. The usual plan is to draw two ends of the warp into each dent of the reed. In many makes of plain cloth, warp ends similar to the body of the cloth may be used, but, in some cases, where those ends are made of fine twist, it is both cheaper and better to use coarser ends, and, at the same time, to employ a smaller number. In other makes of heavy picked cloths, it is necessary to use selva ends of doubled yarn. When these ends are drawn in, one in each heald, and three or four in a dent, a very much neater selva is made; but, when this is done, stronger selva ends will be needful. In some cases, it is found necessary to give the weft, when leaving the shuttle, extra drag, in order to prevent it from forming loops on the outside edge, but, if the looms are kept in good order, this should only be required under extreme circumstances, and for certain makes of cloth. As this drag is, of necessity, trying to the weft, it is obvious that it should not be used unless absolutely essential. It is, however, in cloths which have to undergo some finishing process that this question assumes its most difficult aspect, especially upon cloths which are made by treading the healds in some other way than that employed in making plain cloths. When cloths have to be finished, it must be considered whether the selvages will stand the different processes which have to be employed. If made too tight, (and a tight selva for a grey piece will probably give the neatest selva), the cloth, in some cases, will be found to cockle in the centre, whilst, in others, the selvages will curl, in other cases again they have been known to split, making a rent in the cloth; all these faults cause annoyance to the merchant, and no inconsiderable loss to the manufacturer. It is necessary to consider each cloth upon its own merits, but, with the exception of a few light fabrics, which undergo a finishing process, when considerable side strain is used on the selvages, it would seem to be quite necessary that they should not be as tightly woven as the body of the piece. Starting from this stand point, it is evident that the method employed, say, for making the selva for a weft sateen, would not be at all suitable when used for one for a drilllette. In nearly all kinds of cloth, manufactured by a fancy weave, it is usual to make what is called a "plain selva," or, at any rate, one which has the appearance, when finished, of being plain. When sateens were first made, considerable difficulty was experienced by some manufacturers in making plain selvages sufficiently slack. Considerable claims for damages, resulting from cracked selvages, had to be faced by them, and yet there is probably no cloth in which a good slack selva can be so easily made, especially in those kinds where a great number of picks of weft are employed. In fabrics, where the size of the warp largely exceeds the size of the weft, it is found that the warp does not, in weaving, contract as much as when the counts of the warp and twist are nearer equal. Hence, by having the selva ends much coarser than the warp ends, in the body of the cloth, and also much coarser than the weft, a slack selva of the "corded" class may be obtained. In fine reeds, it would be necessary to draw these ends two through a heald, and two in a dent, and even in some cases to miss a dent. By employing very coarse ends in this manner, the weaver is assisted by decreasing the frequency of breakage in the selva ends, and the appearance of the ribbed selva is very good. Difficulty has been experienced in working, at one and the same time, in the warping mill and slashing frame, yarn of counts so widely different, but this difficulty need not exist. It is obvious that an end of 20's twist will occupy more room upon a warper's beam, than one of 60's twist, and, in warping, much has to be left to the discretion of the warper who, even with the greatest care, finds it difficult, at times, to avoid making beams, the selvages of which may, in the slashing frame, come off either too slack or too tight. Some manufacturers, to avoid this, put in their selva ends at the slashing frame, but this system entails considerable labour, and some little loss of time to the slasher. As this means loss of time to a highly paid servant, employed upon a very expensive machine, this loss of time becomes of importance. Were small expanding combs, used solely for the purpose of guiding the selva ends, to be affixed to the warping mills, much better results could be obtained, and the selva ends could then be introduced at this process. We are not aware of these combs being in use in any mill, but as expanding combs are now utilised in nearly all manufacturing concerns, for the guidance of each end of the yarn, when it is warped upon the warper's beam, we see no difficulty in applying small extra expanding combs, one at each side of the mill, for the use of the selva ends only. These combs are made to expand and contract quite independently of the main comb. When the selva ends are introduced at the slashing frame, a creel is arranged for a given number of bobbins. In this creel, warpers' bobbins



are put, and the yarn is drawn off these in the same manner, as off the back beams. Trouble is often experienced by some of these ends twisting together, and care should be taken that each end is kept separate until they have passed under the squeezing roller in the tin box. The bobbins used should be large enough to hold sufficient length for one set of back beams, so that the slasher may not have to renew the bobbins during the slashing of the set. When this is not done, it is no unusual thing to find that a bobbin has become empty before the slasher has been aware of the fact. The most convenient position for these creels seems to be about half way between the immersion roller and the first back beam. We have seldom seen creels that would hold more than fourteen bobbins at each side; larger creels would be almost too cumbersome. Where more have been required, the additional ends have been run on to the warper's beams at the warping mill.

(To be continued.)



### Crepe Yarns.



OW that the time approaches when manufacturers should be seeking novelties for the next season, our readers may find it to their advantage to know a little about Crepe Yarns. These yarns have lately been somewhat extensively used in Scotland in the manufacture of Madras muslin and similar curtains, as well as in table cloths. They have also been used in Lancashire, by a few manufacturers, to produce certain fancy cloths for dress purposes. In Scotland, they have been chiefly employed after undergoing the process of dyeing, whilst in Lancashire, they have been woven both in the dyed and also in the grey state. It is unnecessary for us to describe the process by which these yarns are spun—suffice it to say that to produce good crepe yarn is by no means an easy task, and that manufacturers should be careful to obtain these yarns from some spinner of repute. Crepe yarns are made spun both twist way, and also weft way, and are spun from 8's up to 60's in counts, and even finer than 60's. The finer counts, however, obtain a very high price. 12's, 16's, 20's, and 32's, are the counts most largely made. These yarns may be used by the manufacturer in a variety of ways. (1) A warp of ordinary spun yarn may be picked with crepe weft. When this is done, the cloth will shrink in width, and the surface of the piece will be fluted, instead of presenting a smooth appearance, as in plain cloth. Again, this can be varied by picking the cloth with one or more picks of twist way crepe yarn, and then an equal number of picks of weft way crepe yarn. When this is done, the cloth comes out much wider, and the surface, instead of being covered with flutes, running the length way of the cloth, will have an all-over wrinkled, or crapey, appearance. By using three shuttles, another variation may be obtained, viz.—by picking one shuttle with filling of any ordinary description, another with twist way spun crepe yarn, and the third with weft way crepe yarn. By varying the number of picks from these shuttles, an endless variety may be attained. It must be noted that, by using fine twist and a coarse reed, the crepe effect is made much more decided. Some cloths have been made with a crepe yarn warp, and an ordinary filling, but, as crepe yarn warp does not weave as well as ordinary yarn, these cloths have, by no means, been a success. The effect can be more cheaply attained by using crepe yarn for filling. When both twist and weft have to be entirely, or in part, composed of crepe yarn, the coarser counts are used for twist; and here, again, variety may be made by using twist way and weft way spun yarns, and these yarns combined with ordinary warp yarn. When this is done, care should be taken that each of the two ends in each dent should be of the same description of yarn, otherwise the weaving will be found to suffer. The all crepe yarn cloths, lately produced in Lancashire, have a most pleasing effect, and should sell, not only in the home trade, but also, when made in suitable colours—in the east, where crepe cloths are held in great esteem. These cloths have been made in different coloured stripes, and the colours—four and five in each piece—have been well chosen. Figured

craped cloth would be a novelty, and should meet with a ready sale. It would be necessary to take care, when designing the pattern, and, probably, small patterns only at first could be, with safety, undertaken. These figured crapes might be made in different ways, but, in all cases, we should recommend the use of both the different kinds of crepe yarn, that is, yarn spun both twist and also weft way. A third shuttle could be employed for picking ordinary filling. Take a satin ground 5, 6 or 8 shafts, according to the fineness of reed employed, probably a 5 shaft ground would be best, and throw the filling upon the surface of the ground. Make the figure as much as possible from the warp, and, should a third shuttle with ordinary filling be used, the picks of ordinary filling might be called in largely to assist. In designing the figure, some allowance would have to be made for contraction in width. We believe that there is a large market open for crepe cloths, which only requires the enterprise of some manufacturer to open out. For some cloths—crepe yarn made from two or more folds of yarn would be most suitable, and in such yarns almost any amount of curl may be obtained. The possible combinations are almost endless, and would suggest themselves to the manufacturer from time to time. Should an attempt be made to enter for the export market, care should be taken to ascertain full particulars as to the widths, weight and colours, required by these markets. The eastern markets, when not affected by previous imports of English goods, are always very conservative, and any great variation in the make of the cloths from those to which they have previously been accustomed, might, at first, considerably affect the success of the venture.

### The Fashions.

Some very charming novelties in light silken fabrics have been manufactured for summer wear. It need hardly be said that these materials are chiefly striped, but there is so much variety and taste in the arrangement of the stripes that their wearers are not likely to tire of them immediately. Faille Chinoise is one of these fashionable novelties; it is a very soft ribbed silk, not unlike a foulard, but of much richer quality than one usually meets with in foulards. This material is striped in various ways, and is also made with wide Persian borders, printed in soft and rather æsthetic colours. Tussur silks will be very much worn, but not the plain styles of past years; the new silks bearing this name are of richer texture, and are striped and figured in various ways. Some of these thick tussurs are striped with broad bands of broché Persian designs in harmonious colourings, with a little gold thread interwoven in the design. They are also striped with broad bands of satin, composed of a number of narrow stripes in a variety of bright colours; these are very effective for skirts, and tussurs with velvet stripes of different widths and colours are also very handsome. These are made up, like all figured and striped fabrics, with plain material to match. Surahs are also revived in better quality, and with the same designs as tussurs, viz., wide satin stripes in many colours, and bands of plain velvet or plush. Surahs are also made with pompadour stripes in lovely patterns, divided by bands of satin; this last material, although altogether demode as a plain fabric, appears in stripes upon every possible kind of background, in wide and narrow stripes, and in plain and mixed colours. Shot surahs are made in the most fascinating mixtures of colours, borrowed from the wings and backs of the most brilliant flies and beetles. Plain faille is in great demand for the foundation skirts of the light woollen materials, of which so many costumes are made, but otherwise it is little used; there are so many new fancy silken materials, that one or other of these is generally preferred. Plain sicilienne, plain French faille, veloutine satin soleil, and other makes are, however, employed, either alone or combined with some suitable figured or striped silk, in making very handsome toilettes, especially for middle-aged ladies, to whom some of the lighter and more fanciful fabrics are not appropriate. Coloured mantles will be very fashionable throughout the summer; they are principally made in shades of bronze and brown faille, and so lavishly trimmed with brilliant metallic beads that black lace is used to a large extent to tone down the vivid colours of the bead ornaments.



## British Consuls Explain why we Lose our Foreign Trade.



CONSUL COOPER, writing to the Government from Santos, Brazil, on the trade and commerce for 1885, points out a great want which our commercial men, in his opinion, seem to neglect, and one which other countries are not slow to take advantage of, to their own benefit, in a business point of view. As his expressed opinions agree exactly with our own ideas on this subject, we will give the portion of his letters referring to this, in the hope that our manufacturers will take the matter into their serious consideration, and that the fruit of this consideration will be a determination to cater for the ever increasing desire for novelty on the part of consumers, not only English, but Foreign. The Consul says:—"The importations to Brazil, from Great Britain alone, amount to nearly half the value of the total import trade. Other countries, notably France, Germany, and America, are attempting competition, but with no marked success at present; the long-standing specialties of British industries always obtain preference. In those cases where the productions of foreign industries compete successfully with, or are superseding those of Great Britain, the cause or fault is generally traceable to the British manufacturers themselves, who, often, too conservative in style and design, obstinately ignore the tastes, wishes, and requirements of consuming markets; whereas, on the other hand, competitors in Germany, France, and America, with a keener eye to business, and more mobile in disposition, spare no pains to adapt and supply goods in accordance with the wants and peculiarities of each country. To exemplify this assertion, mention may be made of the fact that the earthenware and glass trade of this province, until very recently, was supplied from British industrial sources alone, but now is almost entirely superseded by the introduction of German earthen and glass ware. The diversion of this trade is solely due to the persistence with which the British workers, in the face of warnings from their correspondents here, supplied obsolete ware, heavy in weight, and ungainly to the sight; whereas the Germans introduced an article of less weight, and always of the latest modern design, thus at once competing advantageously with the British wares in several essentials, namely, modern forms and patterns to meet the generally diffused desire for 'novelty' and lightness of weight, to economise cost of production, transport freight, and custom duties, paid by weight. By not giving thought to these simple matters, a lucrative trade has been lost to British industries in this province: and what has happened to the earthenware trade may also happen to other branches of trade if British manufacturers, through remissness, allow their foreign competitors to steal on them. Writing on matters of trade generally in Italy, Consul Yeats Brown submits the following observations:—"As to remedies for this state of things, it may be that in some articles, do what we will, we shall not be able to regain our position. No doubt, in Germany, Switzerland, and in this country, workmen content themselves with lower pay; or, what comes to the same thing, work longer hours, and, nowadays, competition is so keen in every trade that the smallest advantage tells. I am convinced, however, that much might yet be done to prevent business slipping away from us, as year by year is now the case, if our people would devote themselves seriously to inquire, on the spot, into the causes that, in each particular case, lessen or prevent the sale of their produce. It is impossible for a Consul, whose duties are so multifarious, and on whose time the calls are so varied, to master details which vary in each different trade, and it would be presumption on my part to attempt to teach men of business how to manage their own affairs. What I would urge upon them, however, is that they must not go to sleep if they mean to keep any hold at all of the markets of North Italy; that the country is remarkable both for industry and intelligence, and is straining every nerve to provide for its own wants of all sorts, without recourse to foreign aid; and that the Germans, Swiss, and Belgians are, by the great

assiduity of their manufacturers and comparatively cheap labour, cutting out both the English and the French in such business as the home industry does not yet provide for. I would, therefore, insist upon our people studying the wants and the tastes of this market more than they do, and would suggest personal visits and direct intercourse with their customers, combined with inspection, on the spot, of the produce of their rivals in trade. It is notorious that German and Swiss manufacturers take far more trouble than we do in these things; that, when they take their holidays, they come to Italy not to see sights and spend their money in buying doubtful antiquities, as many of our wealthy manufacturers do, but employ a part of their time in making the personal acquaintance of their correspondents, and in looking into business with their own eyes." He then proceeds to lay to the charge of English producers exactly the same faults as those of which they are accused by Consul Cowper:—"I am often told by importers of English goods that they have gone on for long pointing out changes and ameliorations in our goods which could be made in England as well as elsewhere, and are demanded by customers, but that such observations are generally unheeded, if not resented; with a result that eventually they have had to betake themselves, often much to their regret, to our German or Swiss rivals, who are always ready to adopt suggestions of the sort, or, at any rate, to go fully into and discuss the matter. The prevailing impression here is that our people are too grand for present times of keen competition, and have the air of replying to any observations in a 'take it or leave it' spirit, which is far removed from the tone of their rivals, and is out of keeping with the present state of business relations between producers and their customers. I am afraid I shall raise a howl against me, in many quarters, by making such a statement, but I feel it my duty to record my belief that one of the greatest benefits that could be conferred on our trade, with all this part of the world, would be the construction of the Channel tunnel or several Channel tunnels. The prospect of such an event must, in the present state of English feeling, be regarded as so remote that it would be out of place for me to enter into detail, but, from a mere business point of view, I believe it would be the very greatest benefit (except the adoption of universal free trade) that could be afforded to our trade. In support of my belief, I think, I need go no further than to state that at the present moment it pays, and it is the practice to bring even such a low class of goods as rails, from Belgium to alongside the water at Savona, by rail rather than by sea. When one comes to consider the effect that an unbroken continuity of land transport would have upon other more valuable and breakable or perishable goods, I think the case is so strong that it need hardly be further argued." Whilst we are touching upon this matter, we submit to our readers an address that was given by Mr. C. B. McLaren, M.P., at Bradford, on the 27th of last month, on the "Extension of the duties of British Consuls in relation to Foreign Trade." He said he had, for years, been closely connected with some of the largest trades which had been suffering tremendously from the depression of business, which was now occupying the attention of Lord Idlesleigh's Commission. It was absolutely necessary, if English men were to maintain their commercial supremacy, to endeavour to lay their finger upon everything from which their trade might be suffering. One fact, which would strike all, was that in neutral, and even European, markets, they found certain influences continually at work against the interests of the British trader. These influences were exercised by Consuls, Legations, and Ambassadors, and they could not help asking themselves how it was that their own Foreign Consuls could not do something, if not to help British trade, at all events, to counteract what he might call the illegitimate influences that were perpetually brought against the traders of this country. He had taken the trouble to look into the matter. In the first place, they had to contend, at an enormous disadvantage, with the German and the French when they sought to place contracts with foreign municipalities. If a town council, in any French town, wished to construct works, the Frenchman was preferred because he was a Frenchman, and not because his work or material was the best. Those influences, he found, prevailed nearly all over Europe, and when they came to face the corrupt influences at work, they found it very difficult to hold their own. Then, in placing contracts in foreign countries, the Consuls of the State, whose subject wished to place the contract, would do what they



could for them. He cited instances where the German Government officials, including Prince Bismarck, had taken an active part in the propagation of the trade of that country. He did not want British Consuls to become mere commission agents, but, at the same time, they had a great danger to face, and it was right that English people should know all the facts. With China and Japan, the same difficulties had to be encountered, for contracts for the construction of ships and ironclads had been withdrawn from English firms and placed with German and French houses, simply because of the influence of the Government officials of those countries. The foreign representatives of England abroad knew very well that if they took any part in promoting the interests of any English syndicate they would not only be snubbed, but would lose their chances of promotion. Attention had been drawn to the syndicate in Shanghai, which was endeavouring to work adverse to English interests in China. Trade with China was of enormous importance to England, for, if the Chinese markets were opened up, English trade would receive a boom which it had not experienced before, and the whole industries of the country would be resuscitated. Yet our Foreign Office had been perfectly indifferent to what was going on in China, but he was glad to say that Lord Rosebery, in consequence of the attention drawn to the matter, had given the English Minister in Peking peremptory instructions to be alive to any movement which was aimed at British trade. He referred to the aid which had had to be obtained from foreign representatives, and said it was a most disgraceful thing that they should be constrained to stoop to apply to the Consul of a foreign Power for the national rights which every English trader ought to have. If English officers were too dignified to take this matter up, then, he said, let us have some one who would do, for he was sure if something was not done soon, they would lose a great deal of trade they might otherwise obtain. He advocated a reform in the issuing of blue books with commercial information, and the establishment of a set of officials to deal with trade abroad, and to send reports for the use of home manufacturers. He was confident that something would be done by the present Ministry in the matter. The subject was generally recognised as one of very great importance, and the mere fact that bodies like the Bradford Chamber of Commerce had shown an interest in the subject, was, in itself, of very great value. He thought that what would be done by those in Bradford would be imitated by other Chambers of Commerce throughout the country, and then they would have action taken at an early date.

### Cottage Industries in Donegal.

Mrs. Hart deserves every encouragement in her scheme for the revival of Irish cottage industries for two reasons. In the first place, she is rescuing hundreds of families in Donegal from abject poverty, and putting them in the way of earning an independent livelihood; and in the second place, the world is distinctly the gainer by the addition of the pretty and artistic fabrics which her philanthropic enterprise is producing. Such articles as the Kell's embroideries, which Messrs. Goodall have on public exhibition at their establishment in King Street, Manchester, are as useful as pictures in brightening a room and educating public taste. Most of them are strikingly beautiful, and it is almost incredible that the brilliant colours are produced by vegetable dyes found in the bogs of Donegal. The embroideries by flax worked on flax have all the brilliancy of silk, and a peculiar softness of finish of their own. The designs are for the most part taken from illuminated MSS. of the seventh century, and are of a quaintly picturesque nature. They are worked up into all kinds of articles—mantel covers, cushions, toilet bags, chair backs, tea cloths, curtains, cosies, tennis aprons, bed coverlets, &c., &c. Everything is done by hand on genuine Irish fabrics. The most artistic productions come from the hands of ladies in reduced circumstances, but some very creditable specimens of needlework have been executed by peasant girls. The peasantry have been encouraged and assisted also to weave by hand Irish tweeds and friezes of pure wool, and to knit hose, &c., with the most gratifying results, their work being of a thoroughly honest and durable character. The scheme is carried on by the Donegal Industrial Fund (founded by Mrs. Hart), solely in the interests of the people engaged in the work, and any profits realised, after payment of wages, are to be shared by the workers.

### EMINENT TEXTILE MEN. No. 2.

#### Thomas Wardle, Esq., F.C.S., F.G.S., F.S.S.

The subject of our second portrait of eminent textile men is Thomas Wardle, Esq., F.C.S., F.G.S., of Leek, Staffordshire, silk printer. For some years past he has been the greatest authority on matters relating to the silk industry, his researches, and the energetic steps he has taken in introducing different varieties of silk into this and other countries, have greatly benefitted those who have been, and are, engaged in the trade. He is the author of a number of papers and works on silk and other subjects, many of which are in connection with trades, viz.:—On the "Geology of the neighbourhood of Leek" (1862); on the "Geology and Chemistry of Salt" (1865); on "Coal Tar and its coloured products," illustrated with all the then known dyes obtained therefrom (1864); on "Limestone, its occurrence, nature, and origin" (1873); "Monograph on the Wild Silks and Dyestuffs of India," illustrative of specimens exhibited in the British India section of the Paris Universal Exhibition of 1878; "Monograph on the Wild Silk Industry of India," forming appendix C. in the Handbook to the British India section of the above named exhibition; papers on the "Wild Silks of India, and on the case of specimens of Wild Silks exhibited by the British India section of the Paris Exhibition" (1878); when a "Diplôme d'honneur, équivalent à une grande médaille," was awarded to the Viceroy of India, as representing the Government of India; lecture on the "Wild Silks of India," principally Tussur, read before the Society of Arts" (1879); "Report to the Secretary of State for India of Examinations of the Cocoons of *Attacus ricini*, and *Antheraea Assama*," (1880); "The Wild Silks of India," A Handbook of the Collection arranged for the Government at the Indian Section of the South Kensington Museum, illustrative of the Wild Silks of India, (1881), (published by the Lords of the Committee of Council on Education, and sold at the South Kensington Museum); an address on "Art Culture," delivered at Newcastle-under-Lyme (1882), to the students at the School of Art, and published; "Report to the Secretary of State for India," at his request, "of examinations of the Dyestuffs of India," in six instalments, with voluminous examples of dyed silk, Tussur silk, cotton and woollen cloths—occupying a period of more than 9 years, from 1874—1883; this report is to be published by the Government, and will be a large work; it will include the methods employed in applying the dyes of India to the above-mentioned fibres and fabrics; "Report, to the Secretary of State for India, of estimation of the quantity of Tannic Acid, or Tannin in the Tannin—containing substances of India"—published by the Government in conjunction with the previous one on the "Dyestuffs of India;" "The Wild Silks of India, and their Economic Utilizations," being a comprehensive contribution to Mr. Rondot's work, entitled, "L'Art de la Soie," the first volume of which was published in 1885, translated into French by M. Charles Marnas and Mr. G. C. Wardle; "Report on the English Silk Industry," for the Royal Commission on Technical Instruction (1885), published in Vol. 8 of the second Report of the Royal Commission, p.p. 29—105; "Report on some Researches on Silk Fibres," forwarded to M. Rondot for the Chamber of Commerce at Lyons. These examinations of the fibres of a number of species and races of cocoons were made at the request of the Chamber of Commerce at Lyons, and are published in France by the Chamber. The Lyons Chamber has since erected, as a consequence of this Report, a Laboratory for the further and regular investigations of Silk Fibre of which M. Dusuzeau has been appointed "Directeur;" "Researches on Silk Fibre," paper read before the Society of Arts, (1885) and published in the Society's Journal; a paper read before the Society of Dyers and Colourists, Bradford, (1885), and published in Society's Journal on "Several Species of Silk Fibre and on the Silk Industry;" and a "Lecture on Silk" at the University College, Nottingham, (1885). Mr. Thomas Wardle is a member of the Society of Arts; Ex-President of the North Staffordshire Naturalist's Field Club and Archaeological Society; was a Juror at the Paris Universal Exhibition of 1878, Silk Section; one of the Commissioners on Technical Instruction; Juror at the International Inventions, London, 1885; Chevalier de la Legion d'Honneur and Officier de l'Académie des Beaux Arts de France. We may add that his work, in connection with this year's Exhibition, is very important. He was sent out by the Government of India and the Royal Commission to enquire into the state of Sericulture in India, and to show the reeler of the Bengal and Tussur silk that much more valuable reeling could be effected by the use of the methods at work in the South of Europe. It is expected, as a consequence of this, that there will be a greatly extended output of raw silk from Bengal, and, assuredly, a great increase and stimulus in the production of Tussur silk. In addition, Mr. Wardle has collected, for the Government of India, with money provided by them, a valuable series of silk stuffs, illustrative of the many different centres of the silk industry in India, all of which are exhibited in the Pavilion of the Indian Palace, and are well worthy of notice and study. There is also a very valuable illustration of Indian embroidery from various important parts, and of the utilization of Tussur silk in Europe. There is no doubt about one thing, viz.:—that the Tussur silk industry in Europe is now a settled one and is gradually increasing. Twelve years ago, it did not exist, and this great change has been brought about by the indomitable energy and perseverance of the subject of this sketch.



## The Cultivation of Flax in the United States.

From the Journal of the Franklin Institute, by JOHN SHINN.

Among the numerous fibres that contribute to the clothing and household comforts of mankind, there is no single one of greater importance than flax, which, when made into woven fabric, is known as linen. There certainly is no material, capable of textile adoption, which has so wide a range, since flax furnishes a fibre suited for the finest, as well as for the coarsest, fabric; clothing for the wealthy, as well as for the poor. Flax flourishes in all climates and soils. Egypt, in the days of the Pharaohs, extensively cultivated flax for the manufacture of linen, where it formed the raiment of the wealthy and refined portion of society while living, and was employed as the only appropriate fabric for protecting their bodies from decay after death. Of the true history of the ancients in the days of the Pharaohs, as manufacturers of textile fabrics, we know but little, and that only by what is disclosed by the mummy pits. Mummies have been found partly wrapped in old linen shirts, napkins, and other articles of domestic use. These prove the general application of linen in Egypt to all purposes of ordinary life. Professor John Greaves, in a book published by him in 1646, speaks of the "linen shroud" of a mummy which he opened, and says:—"The ribbands or fillets, by what I observed, were of linen; of these ribbands, which I have seen, some were as strong and perfect as if they had been made but yesterday." Egyptian priests wore linen only, and it was considered the purest fabric and specially adapted for sacred purposes. We could afford to exchange some of the ancient records we now possess of great crimes and their consequent miseries for the knowledge of one lost art. Even the pyramids, bequeathed to us by Egypt in her glory, would be well exchanged for a few of her humble workshops and factories, as they stood in the days of the Pharaohs. From the earliest dawn of history, flax has been successfully cultivated in the hot valley of the Nile; it also thrives as well in regions as cold as those of the North of Russia, in the sixty-fifth parallel of latitude. This is owing to its rapid growth. In Russia, it is an object of cultivation only in summer, and in Egypt in winter, being sown in the latter country in December and January, just as the Nile has quitted the fields. It is harvested the following April or May. In Russia, it is sown in April or May, and harvested in August and September. Judiciously managed, where the labours of the farm are not suffered to encroach one upon another, there is no single crop which requires so little skill and attention, and affords so ample a remuneration for the outlay as flax. Instead of the farmer dealing with the plant as heretofore, by retting, breaking and scutching, he should content himself with producing the straw and seed, leaving the subsequent processes of retting, breaking and scutching, to those who have special establishments for that purpose, with the necessary improved fixtures and appliances, and whose capital and skill can be more economically and successfully employed. Although it is a fact that many tons of flax are consumed in the United States in making cordage, carpet yarns, threads and coarse cloth, we make no fine linen, such as shirting, sheeting, toilet and table-linen; here, then, is the opportunity for the employment of capital, producing a *staple* article with profits as large as those of cotton, wool and worsted fabrics in their most palmy days. Is not this the question? As the South furnishes cotton to run the cotton mills of England, should not the West furnish the flax to run the linen mills of Dundee and Belfast? Ireland, in 1882, had 118,502 acres in flax, yet the imports of raw flax that year in the United Kingdom were over 20,000,000 dols., in value. In the year 1883, Ireland had only 95,943 acres in flax, producing 18,464 tons of scutched flax, and, in the same year, the imports of raw flax into the United Kingdom were 77,347 tons. The State of Illinois alone that year, 1883, had 90,000 acres in flax, and most of the straw was burned for want of a market. The fertility of our Western lands, improvements in machinery, and the energy of a free people, should enable us to compete with the poorly-paid labour of Europe. On the subject of wages and agriculture in England, Consul Shaw, in a letter to the State Department, dated at Manchester, January 5, 1885, says as follows:—"From a careful study of the cost of preparing the ground and putting in and harvesting crops in this country, I am fully satisfied that farm expenses are more than 100 per cent. dearer, in many cases, here than they are in America, notwithstanding, the much higher wages paid in the States." I will now produce a few facts and figures to show the quantity of imported linens required to supply our home trade, also the extent and quantity of flax now grown in this country, and that the fibres of this flax straw *now wasted*, can, by improved processes and machinery, be manufactured into linen equal, if not superior, to that imported. Consul Wood, of Belfast, Ireland, in his letter to the State Department, of January 8, 1885, speaks as follows:—"With regard to the entire manufactures from flax, except yarns, in Ireland, the returns show that about 70 per cent. are exported to the United States, and of the same class of manufactures from the whole United Kingdom, about 50 per cent. go to the United States. The average value of the exports for the past five years is 13,883,685 dols." The imports of manufactured flax into the United States from 1871 to 1881 amounted to 177,747,371 dols., or nearly 18,000,000 dols., per annum. The importation of linen, in 1883, was as follows:—

Brown linen under 30 cents, yard, . . . . .	\$10,924,649
Brown linen above 30 cents, square yard, . . . . .	2,280,120
Handkerchiefs under 30 cents, yard, . . . . .	488,409

Handkerchiefs above 30 cents, square yard, . . . . .	585,672
Burlaps, etc., . . . . .	4,391,675
Thread, lace and insertings, . . . . .	1,012,759
Thread and twine . . . . .	723,654
Other flax manufactures, N. O. P., . . . . .	814,614

Total imports of flax manufactures, 1883, . . . \$21,221,552

It must be considered that these figures are those of the importers, and not the value for which the goods sell in the United States. It is a well known fact that importers *do not over-value* the goods imported under an *ad valorem* tariff. The flax spinning business of Europe comprises at present 3,000,274 spindles, distributed as follows:—

Ireland . . . . .	874,788	Belgium . . . . .	306,040
France . . . . .	500,000	Scotland . . . . .	265,263
Austria-Hungary . . . . .	384,908	England and Wales . . . . .	190,808
Germany . . . . .	318,467	Russia . . . . .	160,000

The whole number of power looms in use in the year 1884 in Europe, on all classes of goods, is reported as 87,129, of which Ireland had 23,677. There are no statistics to be had of hand loom weaving, though no small amount of it is still done. It is employed to some extent in the manufacture of handkerchiefs and in the finer quality of linens. Russia is reported as having only 160,000 spindles on flax and 3,000 power looms. That country, it is stated, had in 1883, 2,000,000 acres in flax, out of a total of 3,185,074 in Europe. More than half of the flax grown in Europe is raised in Russia. It was reported that Russia in 1883, raised 250,000 tons of flax, of which 54,310 tons were sent to the United Kingdom. In 1882, Russia sent 74,489 tons. Large quantities of flax are also spun and woven by hand in Russia. In case of an extended war with Russia, England must look elsewhere for her supplies of raw flax, or else stop her linen mills. The area devoted to flax culture in the United States, in 1883, was estimated to be 1,750,000 acres, with a yield of 9½ bushels per acre, a total of 17,525,000 bushels, valued at nearly 20,000,000 dols. The fibre from the straw, allowing 350 pounds of fibre to the acre, (small yield) would equal 612,500,000 pounds, which, at only ten cents per pound, would be valued, for fibre only, at 61,250,000 dols. The area of flax culture in the United States for the year 1885, I have not been able to get, but it will not be less than that of 1883; it will probably be at least 2,000,000 acres, as the demand for flax-seed to make oil, is on the increase. The great value of linseed in the United States, for extracting oil and for making oil-cake, and also because of the exceeding worth of the fibre of the flax plant, makes the crop of that plant one of the most profitable that can be raised in the Northern, Western, or Middle States. Owing to the cost of labour in this country, it will not pay to "pull flax;" it should be cut as low down as possible by a reaper and a self-binder, or by a gleaner and self-binder after a reaper, which will allow the straw to dry before bundling; the straw should be well cured in the field. If it is desired to get the fibre out "longline," the seed should be threshed out by a threshing machine, such as is used on rye straw, because such a thresher takes off the seed and keeps the straw straight. "Dew retting" and steeping the flax in earth pits, should be avoided, as there is no control over the elements, and out-door retting is not reliable; many lots of good flax are spoiled by cold nights and by too much rain. In the process of retting out-of-doors, no rule as to time can be given. Flax has been fully retted in five days, yet similar flax has been thirty-two days in the same pit or pond, and was even then insufficiently retted. In Belgium, flax is sufficiently cured in the field, so that it may be held over until the following summer, when it is steeped in slow-running water, while the days and nights are warm. This enables the retting, or fermentation, when once started, to continue night and day until it is ready for "grassing," which is done before the rainy season sets in. Flax from Belgium, when the above method is practised, produces a fibre which, for its excellence, stands pre-eminent, and commands the highest market price. An English textile paper, comparing the flax of Belgium with the flax of Ireland, speaks as follows:—"The Belgium flax, so much admired, and for which so high a price is paid, has been often *nearly* approached in colour and quality by odd parcels of Irish flax. "Courtrai flax is valued on account of its 'nature,' its fineness of fibre, its evenness, and its rich creamy colour. Irish flax has been known to be of almost all lengths in one field; its colour is almost as variable as the districts which produce it, while it is of fair fibre, and generally possesses plenty of 'nature.' If faith is to be placed in the statement that the colour of the flax is owing largely to the method of steeping adopted, the variety of colours presented by Irish flax gives room for much meditation on the modes in vogue among Irish farmers, and on the necessity there is for a little more light on the subject. There is no reason to believe but that the true market value of Irish flax is obtained for it, and, therefore, it is all the more to be regretted that only eight shillings (1 dol., 92 cents) per stone (fourteen pounds) might be quoted as the average price of that fibre, while Courtrai flax can command an average of twenty shillings (4 dols., 80 cents) for the same quantity. It is of national importance that the quality and quantity of Irish flax should increase. In scientific and practical researches, on the process of steeping, lies the means of improving the quality, and this attained, an increase in quantity will follow as a matter of course." From the above, it is seen that the Irish flax brings less than fourteen cents per pound, the Belgian over twenty-seven cents, almost twice as much.



## ORIGINAL DESIGNS.

Our first plate is occupied with the second portrait of Eminent Textile Men. Thomas Wardle, Esq., Leek, forms the subject of this portrait, a further reference to which will be found on another page.

On our second plate we give a design intended for Silk Gauze, a material which promises to be very popular during the summer season. It is used for Mantles and such articles of apparel, as well as for Dresses, and when made up over a coloured lining has an effective appearance. It has been designed by Mr. R. T. Lord, 10, Ann Place, Bradford.

Another pattern, drawn by the same designer, will be found on our third plate. It is suitable for Broché Silk, to be used specially as a Mantle Material.



**Wool.**—There has been more doing during the month in the finer classes of wools in all districts where they have been in demand, and prices have risen from  $\frac{1}{2}$ d. to 1d. per lb. In fact, the market is nearly cleared of foreign and Colonial wools of the finer grades, large purchases having been made on French account. English wools have not taken part in this decided improvement, but still, on the whole, more has been sold at slightly advanced rates. Yarns of fine quality have also advanced in sympathy with wools, and fairly large quantities have been sold, whilst for other classes, the demand has ruled better than for some years past. The piece trade has shown no appreciable signs of improvement, with the exception of a few makes of special fancy goods. Looms are not generally busy.

**Cotton.**—There is nothing particularly new to chronicle in this branch. The cry still continues that profits are almost nil. In the raw material, average sales for home use are made week by week, and this fact would seem to suggest that the volume of trade being done is as large as at any time. Prices have fluctuated slightly. In yarns, the sales have been mostly to supply current requirements, as manufacturers can generally find any description of yarn they may seek without any delay, and, therefore, have no inducement to keep a stock. Prices generally have shown no quotable difference during the month. The export trade has been restricted, owing to harder rates being asked. In cloth, there has been no striking features. Shirtings have improved in demand, although not very favourably in price, and the lighter makes of goods and dhooties have sold fairly well. Other descriptions have ruled as usual.

**Woollen.**—The variable weather, during the month, has affected this branch, and undoubtedly curtailed business to a moderate extent, but, notwithstanding this, an improvement of a substantial character was apparent towards the close of the month. With the advance in the price of wools, it is believed that manufacturers will be in a better position pecuniarily. In worsted fabrics, of the better and lower classes, of effective design, the demand has been good and seems likely to continue, and the same may be said of fashionable goods for ladies' wear. In tweeds of a fancy nature more has been done, and some fair orders are now being executed at rather better paying prices. In the heavy woollen cloth trade, business has been quieter. In the Scotch districts, a fair turnover has passed in cheviots, tweeds and other such like cloths, and prospects seem brighter, on the whole. In the West of England, a moderate business has been done recently, but trade in that district is not too cheering.

**Linen.**—Trade generally has shown no improvement during the month. In the Barnsley district, we can but echo our last month's report, there having been no signs of a revival of trade in that town. In Leeds and other centres, prospects are not hopeful. Hemps and flax have kept steady in price, but the demand has been meagre. In the jute trade, there is no new

feature to chronicle, either in the raw material or in the manufactured article, and those in the trade take a desponding view of affairs. Prices generally are unremunerative.

**Lace.**—No new feature of importance has presented itself in the lace trade, unless a slight improvement in the curtain trade may be said to be important. A fair business has been done in curtains, still the demand has not been sufficient to warrant the running of many machines that have long been idle. Cotton fancy laces of various descriptions have been in demand, especially those with coloured effects. Silk goods have been produced in excess of the demand and have, consequently, suffered in price. Made up goods, such as ruchings, frillings, &c., have only been in moderate request. Manufacturers in every branch complain bitterly of the unremunerative prices.

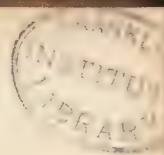
## The Exhibitions.

It is some considerable time since there were so many important exhibitions in existence simultaneously as at the present time. There is the great show in London—the Colonial and Indian, or, as some are attempting to name it, the Colindies, and which we briefly noticed in our May issue. Then there is the exhibition in Liverpool, already dubbed by the name of the Shipperies, and the one in the picturesque city of the Scots, in Edinburgh. As for the Liverpool show, which was opened by Her Majesty during the prevalence of anything but Queen's weather, we do not think we could advantageously enlarge upon it just now. At the opening, things were in a very backward state, showing clearly that some considerable time must pass before it could be considered perfect. We have decided to give attention to the Liverpool and Edinburgh exhibitions in a later issue, particularly noting each feature of interest to textile men. In connection with the Colonial and Indian exhibition, we notice that Mr. Thomas Wardle is engaged in arranging a department exclusively devoted to the subject of Indian sericulture. This, if not already completed will very soon be so, and will form a most important and interesting feature in the great South Kensington show. We may here say a few words in reference to the textiles exhibited in the various courts in the Indian Section of the exhibition. In the Bengal Court, there are some elegant specimens of muslin goods, but these are not so fine as they were formerly, when a piece laid out upon wet grass was invisible, and a square yard only weighed 60 grains, but now, the finest woven weighs almost double, whilst its value is only one quarter that of the finer fabric. There are also some embroideries of great fineness and elegance from Dacca, Calcutta and Moorsheadabad. In the Bombay Court are some very handsome embroidered muslins, and also a variety of beautiful silken fabrics, into the composition of which gold enters largely. The floor coverings, such as carpets and rugs, exhibited in this Court, are very fine, and cannot fail to interest the numerous visitors. There is a feeling of comfort and luxury connected with these carpets, which our Brussels carpets do not give. Still their cost is such as to be prohibitive to the majority of people, although they will stand almost an endless amount of wear. This is apparent when the thickness of the pile is considered. Another point in their favour, not possessed by those of home manufacture, is their richness of colour. This, however, is a matter which has been so often commented upon, that it requires no enlargement here. The Court, in which are exhibited the large varieties of objects from the Province of Oude, is remarkable, from a textile point of view, for its beautiful fabrics of cotton. Futehpur Sikri is represented by a variety of chintzes, stamped by hand in elaborate and tasteful designs. Lucknow has sent some choice embroideries in gold and silver of an exceeding fineness, so fine, indeed, that eight hundred yards of silver wire, used in the making of some of the Lucknow embroideries, is equal in weight to only one rupee. In the Rajpoot States Court, there are to be seen printed chintzes and muslins in a great variety of designs and colourings, many of which are really elegant and effective. The exhibition, as we intimated in our last issue, will well repay a visit, as there is a wide field for study amongst the fabrics here mentioned, and probably many valuable hints might be obtained, which could be effectually brought to bear upon the various textile fabrics manufactured in this country.



June 12th, 1886.

THE JOURNAL OF FABRICS AND TEXTILE INDUSTRIES.



ALBERT SACHS, PHOTO. LITHO.

EMINENT TEXTILE MEN.

No. 2.—THOMAS WARDLE, Esq.





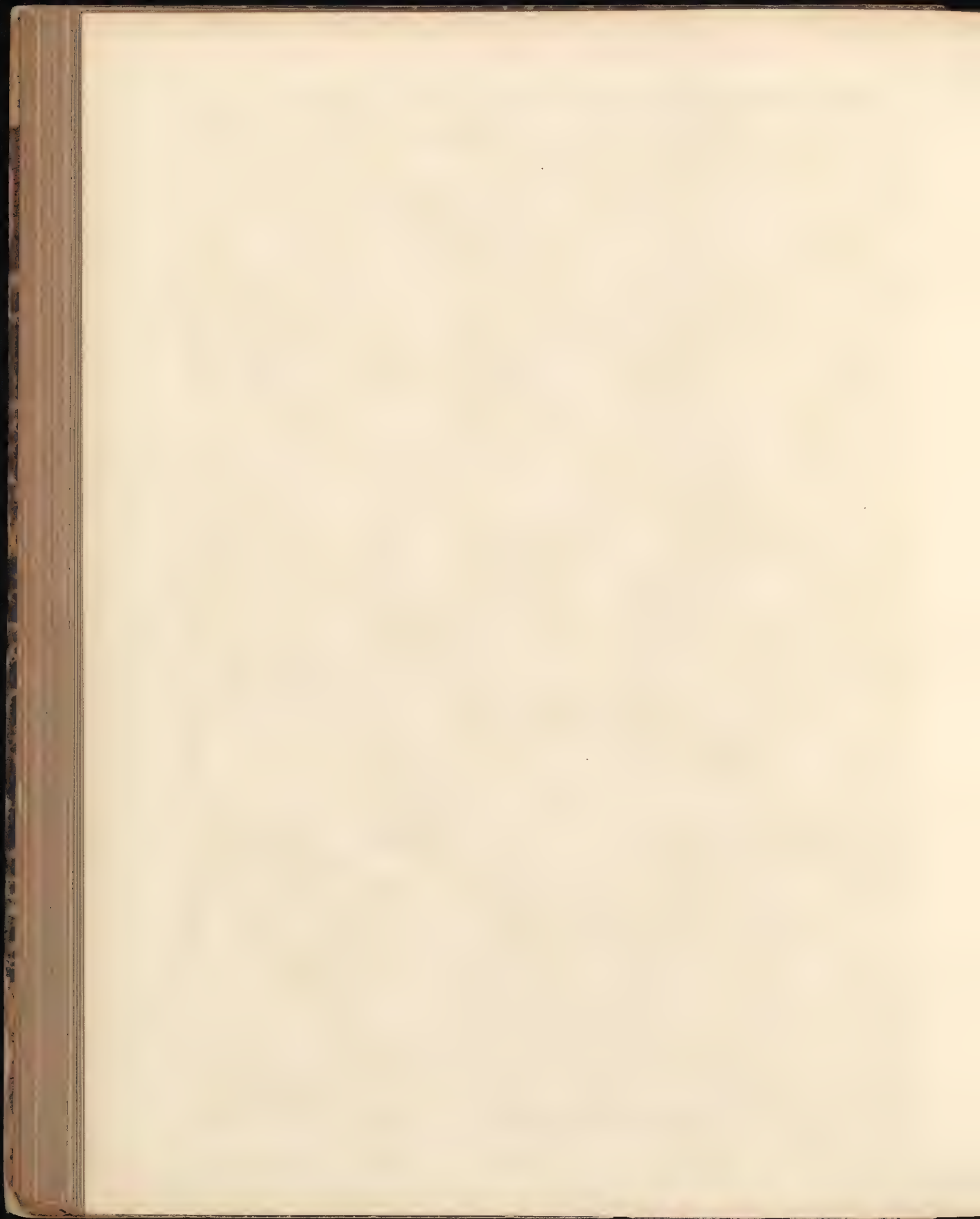
THE JOURNAL OF FABRICS AND TEXTILE INDUSTRIES.

12TH JUNE 1886.

DESIGNED BY R. T. LORD.



SILK GAUZE.





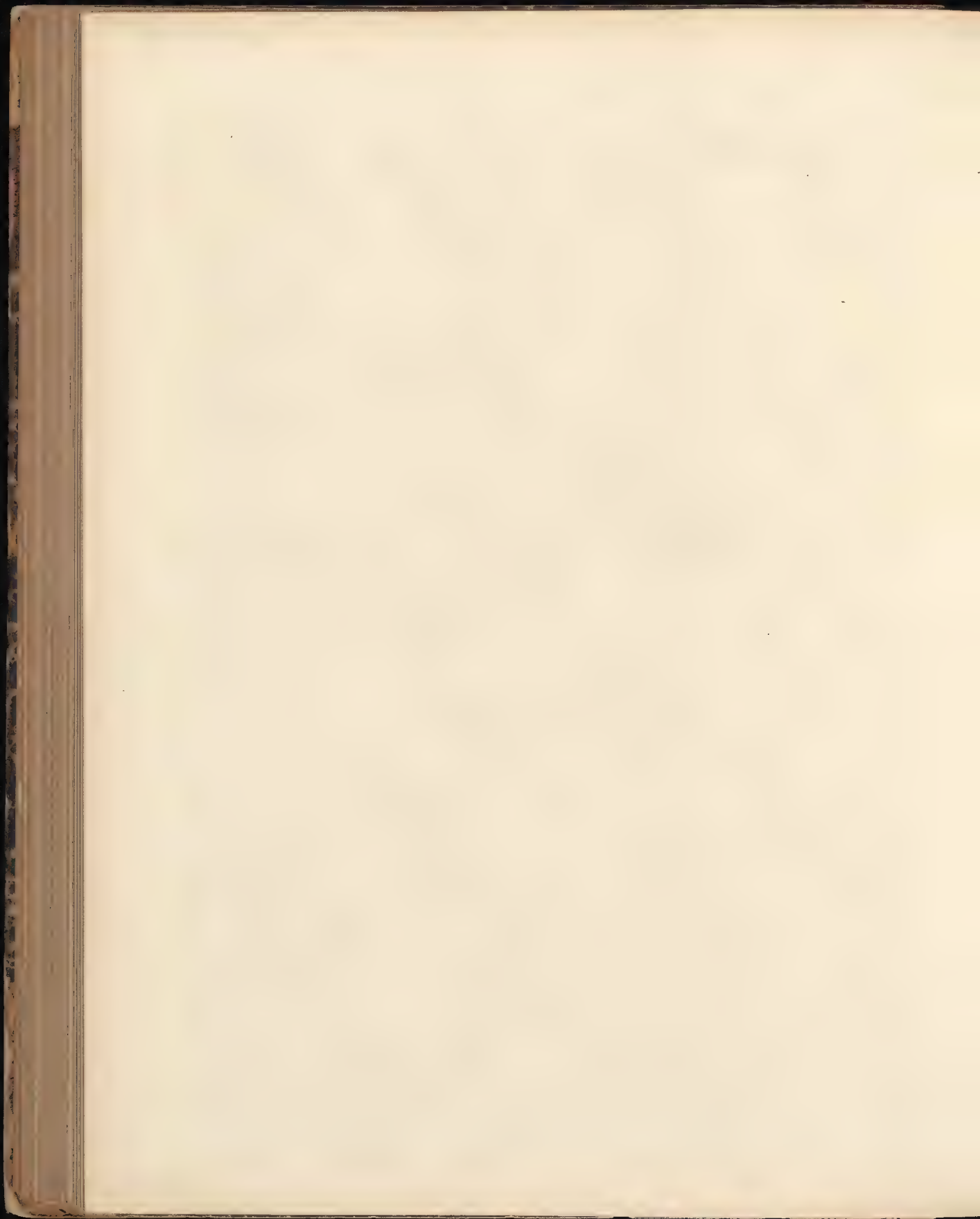
THE JOURNAL OF FABRICS AND TEXTILE INDUSTRIES.

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BROCHÉ SILK.







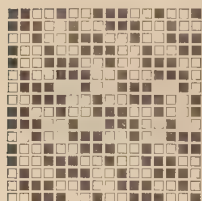
## Black Worsted Coatings.

No. 363.



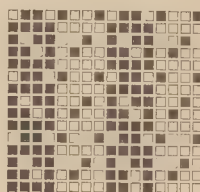
Design.

No. 365.



Design.

No. 364.



Design.

Warp: 2/28 worsted.

Weft: 10's worsted.

4,500 ends.

4's reed.

60's sett.

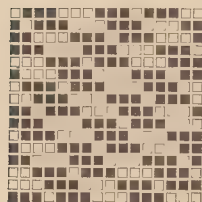
52 picks per inch.

Particulars for Nos. 364 and 365 the same as for 363.

Black represents weft in all cases except No. 363.

## Union Cloths.

No. 366.



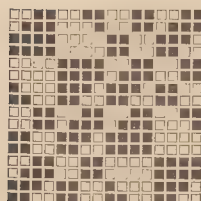
Design.

No. 368.



Design.

No. 370.



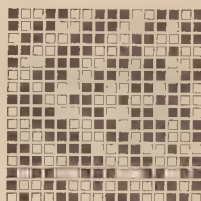
Design.

No. 367.



Design.

No. 369.



Design.

Warp: 2/18 Black cotton.

Weft: 24's worsted.

1,600 ends.

56 picks per inch.

4's reed.

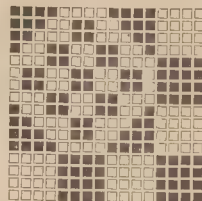
48's sett.

The above particulars apply to Nos. 366, 367, 368, 369, and 370.

Black represents weft in all cases.

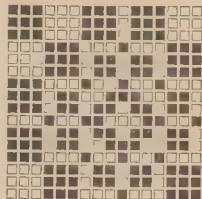
## Cotton Dress Goods.

No. 371.



Design.

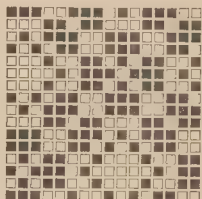
No. 373.



Design.

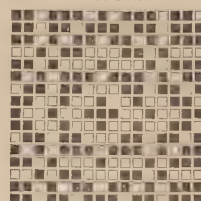
No. 375.

16 shafts. Drawn straight.



Design.

No. 372.



Design.

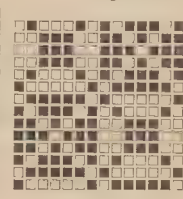
No. 374.



Design.

No. 376.

14 shafts. Drawn straight.



Design.

Warp and Weft:—

2/40's cotton.

60 picks per inch.  
60's sett.

Black represents weft in the designs.

The above particulars are for Nos. 371, 372, 373, 374, 375, and 376.

## Dress Goods.

The following pattern is for Dress Goods. It is designed upon 36 ends, and its construction should be as follows:—Warp, 1/50's cotton yarn; weft, 32's lustre or coloured yarn. Sett, 60's. Picks per inch, 60.

Design, No. 377.



## MACHINERY, TOOLS, &C.

### Gas Engines and Jumping Gas Lights.

An apparatus has been invented by Mr. George Bray, gas engineer, Leeds, which will enable gas engines to be much more extensively used than they are at present. It removes a serious obstacle to their introduction, inasmuch as it entirely prevents the "jumping" of the gas lights caused by them, not only in the buildings in which the engines are working, but even beyond. In some cases, the lights are thus affected within a radius of one hundred yards, and it need scarcely be said that this is a serious objection. In fact, gas engines have had to be removed in consequence of this defect. Mr. Bray's patent is called an anti-pulsator. Under the present system, the gas required for the working of the engine is not obtained direct from the service-pipe, but is collected in a bag, from which it is drawn by the engine as may be required. After each charge, the distended bag suddenly collapses, and is as quickly refilled. These rapid intermittent draughts of gas cause correspondingly quick alterations of pressure in the service pipes and mains, and hence the disagreeable pulsation or jumping of the gas lights referred to. The effect, so far as the engine itself is concerned, is also objectionable. The constant variations of gas pressure in the service-pipes and mains, arising from different causes, prevail in the gas bag, and the engine, being supplied at a varying pressure, its working is less regular than it otherwise would be, and there is, in addition, a waste of gas. Gas engines have been

in use about fifteen years, and many attempts have, in the meantime, been made to remedy these defects; but the result, it is said, has been only partially satisfactory. Mr. Bray's apparatus has the desired effect; the lights are rendered perfectly steady. It is an "anti-pulsator" and a gas bag combined. In construction, it resembles small circular bellows, one end fixed and the other moveable. Inside there is a valve, on one side of which is a long narrow opening or slot. This is so arranged that a comparatively long movement of the valve slide opens or closes only a small area of the slot which constitutes the inlet for the gas. The valve slide is attached by a spindle to the moveable end of the bellows. When the taps are turned on, the gas passes through the slot into the valve case, and then through the outlet end of the case into the bellows. As the gas enters the bellows, the moveable end is pushed outward, and it pulls with it the valve slide, and thus gradually closes the inlet gas port. When the engine takes a charge of gas, the pressure of the surrounding atmosphere forces the moveable end of the bellows inwards; the valve slide is thereby pushed back, and the port, being gradually opened, the gas begins to flow again into the bellows. The apparatus thus far described, would greatly modify the fluctuations of pressure in the service pipes and mains, and mitigate the annoyance resulting therefrom; but it would not completely stop the "jumping" of lights, because every pulsation of the bellows would move the valve slide, and by thus allowing more or less gas to enter, would alter the pressures in the pipes and mains. To prevent this, the spindle is passed loosely through the valve slide, and on it are placed two stoppers, one on each side of the slide, and so far apart that the spindle can move backwards and forwards for some distance without the stoppers touching, and thereby moving the slide. By these means, the ordinary pulsations of the bellows, following normal charges, do not move the slide, and it is only pushed backwards or forwards when the engine requires a considerably larger or smaller quantity of gas. Thus the "jumping" of lights, resulting from the working of the engines, is entirely obviated. The apparatus is so arranged that the gas inlet into the bellows is completely closed before the bellows are fully distended, consequently, whatever may be the pressure in the pipes and mains, the gas in the bellows is maintained at practically atmospheric pressure, and is delivered at that pressure to the engine in unvarying quantities at each charge. The working of the engine is thereby rendered more regular, and a considerable saving of gas is effected. The apparatus can be easily fixed, it occupies less space than the ordinary bag, it has no delicately constructed levers or valves, and it requires no adjusting or attention. The "anti-pulsator" is not liable



to escapes of gas, as the gas in it is maintained, as before mentioned, at practically the pressure of the surrounding atmosphere. The "anti-pulsator" has, in several cases, been adopted in Leeds with complete success. There are, at present, about 12,000 gas-engines at work in Great Britain, and there is little doubt that when the existing patents run out, three or four years hence, the number will be largely increased. The public generally are not disinterested in the matter, for the adoption of gas in place of steam must tend to diminish the smoke nuisance of towns.

### Improvements in the Method of Producing Designs on Cloth and other Fabrics.

A patent has been granted to H. J. P. Kirk, of the firm of Messrs. J. M. Kirk and Sons, of Old Lane Dyeworks, Halifax, for the above-named invention. In order to produce designs on fabrics, the cloth passes through the ordinary perpetual cutting or cropping machine, and, instead of passing over the usual bed, or beds, it passes over a roller, or rollers, or other suitable bearing, having upon its, or their periphery, or surface, a raised design, or designs, and the spiral, or other cutting blade, cuts or forms the design upon the face, or nap of the cloth or other fabric according to the raised design on the roller or bearing surface; different designs can be formed in the same machine by changing the rollers or bearing surfaces. This method can be applied to the Lewis, or cross cutting machines, the raised design being similarly formed upon a sheet, or upon a flat bearing surface, instead of upon the roller, and the bearing surface moved forwards as required; the design can be cut more or less distinct by adjusting the cut or depth of the spiral or cutting blade.

### The Anglo-Spanish Treaty.

The following table shows the difference between the present duty per hundred weight on textile goods exported to Spain from this country, and the most favoured nation treatment duty per hundred weight.

Cotton Fabrics, close-woven, plain, unbleached, bleached, or dyed in pieces, and Handkerchiefs, presenting in warp and woof in the space of six square millimetres:—		Present duty.	Most favoured nation duty.
25 threads or less .....	6	11	3 2 6½
26 do. or more.....	5	9 8	3 10 8½
Cotton Fabrics—printed, as well as pieces twilled or figured:—			
25 threads or less in the above-mentioned space ..	8	2 7	4 17 6
26 do. or more.....	7	10 4	4 17 6½
Light tissues, as muslins, cambric, lawn, book muslin, and gauzes of all kinds .....	6	11	4 11 0
Piques and quiltings .....	9	2 11	4 6 1½
Plush, velvets, and other napped goods for clothing ..	7	2 3	4 17 6½
Tulles .....	10	3 3	8 9 9½
All kinds of crochet work .....	6	11	4 16 0½
All kinds of lace other than crochet .....	12	14 0	10 19 9
Knitted goods in pieces, vests, shirts, or drawers..	5	6 5	4 0 0½
Knitted stockings, socks, gloves, and other articles ..	10	13 5	6 3 6
Tissues in linen or hemp—Plain:—			
Up to 10 threads inclusively.....	2	10 10	3 15 4½
From 11 to 24 threads .....	5	1 8	4 8 1½
25 threads and upwards .....	8	12 9	7 10 4½
The above tissues when twilled or figured.....	4	1 3	3 14 4½
"Laces (of linen or hemp).....	25	8 2	25 7 9½
"Knitted .....	10	3 3	9 6 0½
"Carpets .....	0	10 2	0 10 1½
Woollen Goods:—			
Carpets.....	3	11 2	2 1 10
Felts .....	1	10 6	1 4 4½
Counterpanes .....	4	11 6	3 12 8½
Cloths and all other drapery goods in pure wool..	16	5 2	8 14 8½
Cloths and all other drapery goods in wool and cotton mixed—3-5ths their weight as wool, and 2-5ths as cotton .....	—	..	5 5 7½
Other tissues in pure wool .....	10	3 2	7 2 2½
Do. do. in wool and cotton mixed.....	—	..	4 8 1½
Knitted goods in pure or mixed wool.....	8	2 7	7 0 1½
Tissues of Silk:—			
Plain and twilled.....	35	9 4	20 6 3
Velvets and plushes .....	53	4 0	24 7 6
Tissues of floss-silk, silk waste, of raw silk, and silk waste mixed with silk .....	18	4 0	10 3 1½
Tulles and laces of silk, or silk waste .....	45	14 8	14 4 4½
Knitted goods in silk, or silk waste .....	28	0 0	20 6 3
Silk velvets and plushes, with warp or woof in cotton—duty 2-5ths as silk and 3-5ths as cotton ..	—	..	16 5 0
Tissues of silk, with warp or woof in wool—duty 1-5th as silk, 4-5ths as cotton .....	—	..	8 2 6





## German Enterprise in Foreign Trade and Commerce.

**T**HE enterprise of the Germans in the extension of their trade and commerce, has, of late years, been a theme of much observation. This enterprise is very real and very successful. Germany seems determined to run the other nations of Europe a hard race for commercial supremacy, and it is becoming more clear every day that, unless the other nations are to be dead beaten in the race, they will have to resort to new, or at any rate, more vigorous methods of pushing their trade. A significant article on this subject appeared in a recent number of the *France*, from the competent pen of M. Simonin. It is important that Yorkshire manufacturers and traders should know what their Teutonic competitors are doing, and a few of the most salient passages from M. Simonin's article will doubtless be interesting and useful to them. The other week, M. Simonin says, a German steamship, freighted by the Geographical Society of Berlin, stopped at Lisbon, where it put the whole population into a state of excitement, and from there it continued its voyage to the principal ports of the Mediterranean, especially those of the South of Spain and the Levant. This ship is only the forerunner, the first vessel of the "fleet of universal commerce," which will be composed of about a dozen other ships, and which the Geographical Society of Berlin is at present organising. It is a veritable floating exhibition, a sort of maritime bazaar, distributing catalogues, price lists, samples, and selling German goods of all descriptions—textile fabrics, arms, furniture, tools, agricultural implements, Saxony porcelain, Nuremberg toys, Frankfurt sausages and smoked hams, Munich beer, Krupp cannons, Bavarian lithographic stones, &c. The President of the Geographical Society of Berlin was on board the *Gostorp*, that being the name of this curious ship; and we Frenchmen, who have in Paris two Geographical Societies, one of which, the youngest, bears the name of Commercial Geography, and numbers among its members all the great merchants and traders of Paris, ask that this Society—assisted, if need be, by the Chambers of Commerce at Paris, Havre, Marseilles, Lyons, and Bordeaux—shall also send out a "sample" ship, even if it be to Chili or Australia. Our commerce will thus be better informed, and will learn to be less timid. There are in Germany 250 "commercial schools," the principal school being at Leipsic, together with industrial and apprenticeship schools and industrial museums at Nuremberg, Berlin, Munich, Dresden and Elberfeld. The Commercial Society of Berlin is not the only one which takes vigorous action. There is at Hamburg a Colonial Society. It is known how Prince Bismarck seeks to establish colonies everywhere, and in what an astonishing way he succeeds. At Bremen, Stettin, Bonn, Stuttgart, and Munich, there is a number of these societies, and at Berlin, attached to the Zollverein, there is an Exportation Committee. Out of 635 consular agents of Germany, there are only 56 political consuls. The rest, or 579 agents, are trade consuls, who move about the place where they are stationed, visit factories, and give practical information to the traders of their country. Here is a good example to follow, and we ought to try to imitate our neighbours. Salaries and wages in Germany are less than ours, because life is simpler, and food and lodging cheaper. Besides, the working-men do not resort so often to strikes. As to the merchant marine, Germany excels us (France), if we take account of both sailing and steamships. But in steamships alone we are happily above her. We are second in rank, indeed, of all the merchant navies of the world, England holding the first place. The Germans produce coal, iron, and other metals, cheaper and in greater abundance than we do. In 1885, the Germans got more than 73,000,000 tons of coal, and we, (the French) less than 20,000,000 tons. Germany produced 3,653,000 tons of pig-iron for moulding and the manufacture of iron and steel; we scarcely 1,622,000 tons. Germany produced 114,000 tons of zinc (principally in Silesia), 73,000 tons of lead, and 20,000 tons of copper. We only

produced a few thousand tons of these three metals, and these for the most part with foreign ore. Germany has a greater length of railways than France—37,000 kilometres, against our 32,000 kilometres. German exports in 1884 amounted to 3,269 million marks, or 3,986 million francs, and her imports amounted to 3,285 million marks, or 4,106 million francs, giving a total of 8,092 million francs. The French trade for the same period was—exports, 4,218 million francs; imports, 5,239 millions; total, 9,457 million francs. Germany is far from surpassing us, but her exportations to us have increased from year to year. In 1884, we exported from Germany 449,000,000 francs worth of goods, and we imported into Germany only 330,000,000 worth. With reference to the development of internal navigable waterways, and the creation of maritime canals, Germany is thinking of it every day. The Jutland Canal, which is to unite the Baltic with the North Sea, is decided upon, and as to internal navigable waterways "The Central German Association for the Advancement of the Navigation of Rivers and Canals" informed us the other day that in ten years, from 1873 to 1883, the tonnage of goods upon the Rhine, near Emmerich, had doubled; that that upon the Elbe, near Hamburg, had tripled; and that that upon the Oder, near Stettin, had more than quadrupled. All this, our contemporary holds, ought to serve as a lesson, and if it serve as a lesson to Frenchmen, it may serve equally as one to ourselves. In 1876, when the Universal and International Exhibition was held at Philadelphia, the German Commissaire was heard to say, "Our productions are cheap but bad." (*Billig aber schlecht.*) But since then Germany has progressed with giant strides, and has profited by the lesson received at Philadelphia. She has perfected her manufactures while continuing to produce cheaply, and has increased her exports, notably to us. May all this serve as an example of what remains for us to do in order to develop our commerce and industry. This is a sound and sensible article, far from all exaggeration. And it is as full of suggestion for the Government, and for the merchants and traders of England, as it is for the Government and merchants and traders of France.

## Foreign Competition in the Textile Trades.

### THE LABOUR QUESTION.

It is maintained, by those most interested in the textile branches of trade in this country, that the sting of foreign competition gets keener year by year. Various reasons are advanced for this state of affairs, by those who are considered the best able to judge from different stand-points. The outcome of the Technical Commission, by which a mass of facts relating to this question were placed before the public, has, perhaps, to a slight extent, been of benefit to our manufacturers, but still there has not followed that improvement in trade which was expected, when the information was placed by the Commission before the public. One very strong point made use of by the Commissioners, as our readers are well aware, was that this country was much behind the Continental manufacturing communities in the matter of technical education, and when the report was made, our manufacturers generally acknowledged that this was, in a great measure, true, and, in consequence, steps were immediately taken with a view to remedy the deficiency, by the founding of technical schools in our leading centres of industry, with, in some cases, branches in the districts included in these centres. But, notwithstanding the energetic steps that were taken, bad trade (in some districts worse than before, and in others but slightly better) has been the rule, and, judging by reports in the daily press, the prospect of an early revival seems but slight. In the monthly returns of the Board of Trade, the volume or quantity of goods exported from the United Kingdom to various countries abroad is not, in the aggregate, taking the monthly average of the past twelve months, sensibly less, and this is in itself a satisfaction to the producers, but, on the other hand, profits are generally small, and not sufficient to pay for the outlay of capital, and the expenditure of energy and brains. The producers of all classes of goods complain that they have much harder to work for the little they make than has been the case at any time during the present generation, and with results much less satisfactory. The remedies suggested for the existing



state of things are numerous, some propose the imposition of tariffs, and this has been well ventilated by both politicians and those specially interested in trade matters; others say that the whole secret of our difficulties may be found in the labour question, and it is on this branch of the subject that we wish to say a few words, as we consider that in this lies one of our greatest troubles. It is a well known fact that our Continental textile competitors pay wages much below the average of those paid in this country, and, at the same time, their employes work longer hours for the less wages, being able to live at less expense than the working portion of the population in this country. This bare statement would naturally lead those, not well versed in the matter, to conclude that, this being the case, the Continental producer could sell his goods for much less money than it would be possible for us to take for ours. But it has been proved, beyond doubt, that the foreign workman, with his long hours of labour, does not produce an appreciably larger quantity of goods than the Englishman with his nine hours a day, and this fact, in a great measure, reduces the dangers of foreign competition. But still the lowness of wages is greatly against our making any further advances in our export trade in the future, and, at the same time, it handicaps us in competing with manufactured goods which are sent to this country from abroad. In our opinion, the present gloomy outlook will continue until the wages abroad are brought up to an average of those in this country, or those at home reduced to an average of Continental countries. The time, when this state of things will exist, seems now somewhat remote, but, nevertheless, judging by the strikes occurring from time to time in France, Germany, Belgium, and other countries, it is, perhaps, nearer than most of our producers imagine. The workmen of the above countries become more enlightened every day as to the different conditions of labour and wages existing in their countries and in England, and are gradually, but surely, pushing ahead in the matter, to the evident concern of their employers. A writer from Germany says:—That the markets of the world are fast closing against English labour. In all countries, protective tariffs are being put on English goods, and raised until the people of the country can compete successfully, at least, in their own land, with English-made goods; and bounties are being given upon goods for export to sustain manufacturers who are willing to take up an export trade. All this is evil and injurious to the English workmen, but a worse danger is not looming on the horizon, but has already well risen, and threatens terribly to darken still more their prospects; and this not wholly rare, but rapidly increasing, cloud is the employment of English capital, and English thought and brains, combined with foreign labour and foreign machinery, and what is still more hurtful, foreign rates of wages. He then goes on to show the great disadvantages under which the English producer labours on the wages subject, and concludes by asking whether the question of foreign competition with English labour is not, after all, the most serious that our statesmen have to deal with. It is a question that time alone can settle, as it is beyond the powers of any representative parliament to deal with.

### Berandine, the New Peat Textile.

The *Handelsmuseum* states that Berand, a manufacturer of Maastricht, has discovered a method of extracting from the outer covering of a particular kind of peat, a textile, to which he has given the name "Berandine." The goods manufactured from this fibre, are said to resemble some woollens, but, are produced at a much cheaper rate; they keep their colour well, and measure 15,000 m. to a kilogram—by adding to the textile, from 40 to 50 per cent. of wool, cheap fabrics can be made that will stand no small amount of wear. A piece of cloth made from the mixture, after having been worn a year, showed the Berandine intact, whilst the wool had worn away. Berand is at present weaving a fabric containing 70 or 80 per cent. of Berandine, which he hopes to be able to sell at 2.12 francs per metre. The inventor mentions a variety of purposes to which this textile may be applied, viz.:—for upholstery, and for surgery uses. In connection with the latter object, experiments are being made in France and Holland. Berand is endeavouring at the present time to form a company, for the further development of his plans.



### The Royal Commission on Trade.

The Royal Commission on the Depression of Trade has published an appendix to their Second Report which contains valuable reports from diplomatic and foreign consular agents upon the state of trade in the principal foreign countries. The consular reports from the various parts of Germany will be found of interest. These may be briefly summarised as follows:—It is agreed that business generally is brisk, that markets are extending, products improving in quality, wages higher, though less in the case of skilled than unskilled labour, and that capital is plentiful, but profits everywhere steadily decreasing. Prices, too, in nearly all the chief branches of industry have been falling, especially those of coal, iron, the raw materials of the chemical trade, and raw textile materials. The chief British articles which have been displaced by native products are pig iron of all kinds, excepting some of the best Scotch brands, British agricultural machinery, gas and boiler tubes, and ironmongery. British raw chemicals and chemical manufactures have also been thrust out entirely, and to some extent, at least, such manufactures as linoleum, jute, waterproof goods, and hatting materials. At Dusseldorf, native manufactures of cutlery of a superior kind are made and largely exported to England, whence they are re-exported to America bearing English marks. In textile manufactures, seven English firms, chiefly Yorkshire ones, have set up mills in various parts of Germany. German competition in textiles appears, however, to have displaced French productions even more than those of England; and the velvet and silk industries of Crefeld are specially mentioned as having injured those of Lyons. A subject of very general complaint is that English producers are imperfectly acquainted with the requirements of the German markets, and that, if our export trade with them is to be maintained, greater efforts must be made, especially by means of efficient travellers, to ascertain with greater exactness the wants and tastes of consumers. With regard to many articles, such as shoddy, jute, and some Birmingham, Sheffield, and Bradford goods, there is now, however, no prospect of competing successfully with German producers. The comparatively low and uniform rates of freight prevailing on the German railways are named as one cause of the advantages enjoyed by German manufacturers. German labour is highly praised for its steadiness and efficiency, and these qualities are partly attributed to the compulsory military training of the population. A further advantage tending to increase the value of German labour is traced to the State aid afforded by the establishment and endowment of an admirable system of technical schools, giving education in all branches of industry, and in all the chief manufacturing centres. At Hamburg and at Berlin, museums for the display of exportable goods are being established, but they have not existed long enough to show how far they have answered their purpose. The report from Vienna refers to the great increase, in recent years, in the number of manufactories, and especially of cotton mills, existing in Austria. Cotton yarn, formerly imported from England, is now almost entirely supplied by native spinners, the further requirements of the country being chiefly satisfied from Switzerland, Austrian mills too, which formerly produced only the lower counts, are now able to spin the higher ones in effectual competition with foreign yarn. Cotton goods, too, which used to come from Manchester, are now produced at home, even cotton velvets being excluded either by native or by German products. These changes, both as regards yarns and goods, have come about within the last four or five years. Worsteds and woollen goods, also, formerly drawn from Bradford, Leeds, Huddersfield, and other Yorkshire towns, are now largely produced either at home or in Germany. The same remark applies also to jute manufactures. With regard to the share which the tariff has had in bringing about these alterations, the following remarks are interesting, in view of the proposals, now before the Austrian Legislature, for an increase in the import duties:—"The falling off of the imports from Great Britain commenced at the time when the special treaty of April 30, 1868, between Great Britain and Austria expired—that is, on December 31, 1877; it continued when the stipulations of the Customs tariff of the 27th of June, 1878, commenced to work, and it reached its culmination through the stipulations of the last Customs tariff now in force, of the 25th of May, 1882; but we have probably not yet seen the end of the war of tariffs, for a further increase of Customs duties is contemplated, and viewed with great satisfaction by the Austrian Chambers of Commerce, some of them even requesting the Government to impose higher duties than were even contemplated by the Government." It should be observed that since the Austrian occupation of Bosnia, British exports to that province have all but ceased. In Hungary, trade with England has fallen off greatly since 1882, and this is ascribed partly to the low prices of agricultural products, and partly to the competition of Austrian manufactures. But so far as steam engines and agricultural machinery are concerned, it is put down mainly to the establishment of engineering works on a large scale in Hungary itself.



### Woollen and Cotton Manufactories at the Cape.

For a considerable period, the Cape Government has been urged to establish, in the Cape Colony, manufactories of cotton and woollen goods. The question has been more eagerly discussed since the commercial depression in South Africa became so serious, and since Cape produce has obtained such poor prices in London and Liverpool sales. Responding to repeated requests from different parts of the colony, the Government has introduced a bill, which has been read a first time, "to encourage the establishment of manufactories of woollen and cotton goods." The measure now before Parliament was prominently referred to in the opening speech, and provided for the yearly payment of a certain sum of money from the public chest to any co-partnership or persons establishing, or intending to do so within a specified time, a woollen or cloth manufactory in the colony. It has been long urged that a certain measure of protection is essential in the establishment of new industries in a comparatively new country. For a long period, English cotton and woollen goods have been heavily taxed, and this new proposal seems likely to eventuate in the protective principle securing further adhesion. Until, however, the debate takes place on the motion for second reading of the bill, it will be difficult to accurately ascertain the feeling of the Cape Parliament. At present, the Cape Government has to cope with a steadily falling revenue and a heavy expenditure, the result of injudicious borrowing during a former Administration. As the matter of a bonus for new industries may be of some interest in this district, we recapitulate the main conditions of the bill, which are as follows:—(a) The buildings and the plant of the manufactory to be kept in good working order to the satisfaction of an inspector appointed by the Government, and to be at least of a value stated by the Act. (b) The goods manufactured to be from wool or cotton grown in the colony. (c) The manufactory to be continued for a stated period beyond that covered by the public contribution. (d) The goods manufactured in each year under the agreement to be of at least a marketable value to be stated by the Act. (e) Security to be given, if required, to the Treasurer of the colony for performance of the terms of agreement. (f) Questions of value and questions relating to the construction or execution of agreement to be referred to a standing board of three persons nominated by the Government.

### The French Woollen Trade.

Reporting on the French woollen industries, the "Jacquard" says that the chief event of the past fortnight has been the sudden advance in the price of wool, induced, it is believed, by orders for goods received by manufacturers. The Elbeuf journal is doubtful, however, whether, so far, at least, as carded woollen goods go, the slight revival which has been manifested in the French centres of this branch of the wool industries justifies the higher price of the raw material. As regards worsted stuffs, however, the case is different. Numerous and important orders have been received at Roubaix and Tourcoing, and the combing establishments have difficulty in supplying the demand, though several are working day and night, as the orders received are for execution within a very brief time. Rheims is also profiting by the movement, but to a less degree; it is, however, stated that the prices of the fabrics have advanced slightly. From Sedan, it is reported that business, though still far from brilliant, has manifested decided tendencies to improvement, a number of provincial buyers having visited the market; and one large firm, which had curtailed work one day per week, has resumed full time. At Fourmies, it is complained that the prices of the manufacturers do not improve proportionately with the advance in wool and yarns, and hence those manufacturers who do not also carry on the combing and spinning operations, and those who do, but who neglected to cover their orders for goods with supplies of wool before the advance set in, are said to find themselves now in a worse position than even before the revival. The position has been further complicated by strikes in various establishments in Fourmies, Sains, and Trelon, in support of demands by the operatives for a restoration of wages to the scale before certain reductions made during the depression. Symptoms of revival are apparent also in Belgium, increased activity being reported from Verviers.

### Proper care of Leather Belts.

Some manufacturers of belting recommend running the grain side next to the face of the pulley, and claim a much greater percentage of power to result therefrom. While one thinks that the grain side should always be run next to the face of the pulley, our experiments do not warrant us in saying that there is any gain of power worth speaking of in this respect. The results given in several tests that we have made are about the same in either case, whether the flesh or grain side was presented to the face of the pulley. Our reason, then, for recommending the grain side to the pulley, is not with a view of obtaining more power from the same belt with the same stress, but arises from the fact that there is more strength in the flesh side of the belt than there is in the grain, and that part which possesses the most strength should be subject to the least wear. For instance, if a piece of leather belt, say .20 of an inch thick, be split exactly in the centre, and each part be submitted to a breaking strain, the part next to the flesh side will stand nearly twice the strain before breaking that the part next to the grain will stand, so that a belt run with the grain side to the pulley, when worn down to nearly half of its original thickness, will retain nearly all its original strength, unless otherwise injured, while another belt, run with the flesh side to the pulley, when worn down to the same thickness, will not retain more than one-half of the original strength under the same circumstance. When belts become dry and hard, they are not only liable to crack, but they do not adhere to the pulleys, but slip, and the heat generated by the friction generally burns them, so as to materially impair their strength.—*The Milling World*

### Novelty in Mantle Cloths.

We have had forwarded to us from Paris a piece of woollen cloth, which appears to us to be one of the latest developments in styles for mantle materials. The fabric referred to is a plain coloured cloth with a "West of England draw finish." Upon one side is printed, on a brown ground, a small check effect; this, we judge to represent the back of the cloth; on the other, or face side, ornamental figures are printed, in both cases the colour employed is black. It is scarcely necessary to add that any other colours could be used to suit the various tastes of the buyers. The object in ornamenting both sides appears to be that a mantle could be so constructed as to be wearable on either side, and thus, being minus lining, would form a light and comfortable covering for summer wear. We beg to recommend the fabric to the notice of those of our readers who print cloths, and to suggest the advisability of turning their attention to the preparation of it before our markets are stocked by French producers.



It has been unanimously agreed by the "shuttle machine" embroidery manufacturers of Herisau, Switzerland, to reduce the hours of labour by one half until further notice.

A machine has been invented in Germany, likely to cause a great change in the embroidery industry. It is claimed that the machine will thread 18,000 needles in a day (10 hours), including all necessary delays, at a cost of 1½ marks instead of 6·90 marks, the wages paid to women and girls, who, hitherto, have been employed to do this work. It is said that embroideries worked with needles threaded by this machine, have turned out, in every way, satisfactory.

The Garden Party at the Viceregal Lodge, Dublin, judging by reports, passed off most satisfactorily. As was desired, by Lord and Lady Aberdeen, every article of attire worn by those present, was supposed to be of Irish production. The home products, therefore, having been brought prominently before the public, it is to be hoped that the impetus given to the various branches of manufacture may be attended with beneficial and lasting results. It is intended to bring Irish manufactures still more prominently before the public, as there is a project on foot for the holding at Clonmel, some few months hence, a veritable exhibition of local products, perhaps of all Irish wares, if the scheme has the promise of substantial support.



### Receiving Orders.

Clarke, J. W., 58, Dryden Street, Nottingham, lace manufacturer.  
Forth, J. F., Carver's Factory, Ashforth Street, Nottingham, lace maker.  
Stansfeld, G., 49, Brook Street, Bradford, worsted manufacturer.

### Adjudications of Bankruptcy.

Clarke, J. W., 58, Dryden Street, Nottingham, lace manufacturer.  
Forth, J. F., Carver's Factory, Ashforth Street, Nottingham, lace maker.  
The following amended notice is substituted for that published in the *London Gazette* of April 20.  
Hirst, S. H., (trading as George Hirst), 5, Quebec Street, Leeds, Yorkshire, woollen manufacturer.  
Redman, M., 16, Bertram Road, Manningham, Bradford, worsted spinner.  
Stansfeld, G., 49, Brook Street, Bradford, worsted manufacturer.

### Dissolutions of Partnership.

Austin, J., jun., and H. Atkinson, Long Eaton, Derbyshire, lace manufacturers.  
Harris, C., and Howarth, W. T., Manchester, quilt manufacturers.  
Hogg, R. W., and R. J. Gray, Milton Street, London, merchants.  
Johnson, H. S., and Strassmann, J., 1, Milton Building, Watling Street, London, warehousemen.  
Sutherland, J. A., J. Wharton, R. Sykes (executors of Harvey Kemp, deceased), and R. Sykes, Cleckheaton, Yorkshire, flannel manufacturers.

### Dividends.

Ward, M., (trading as Richard Ward and Sons), Ings Mills, Batley Carr Dewsbury, woollen manufacturer, 2s. 6d., Balm Mills, Liversedge.

## PATENTS.

### Applications for Letters Patent.

A new block printing machine for textile or other fabrics. J. H. McFerran, Belfast.	30th April	5,866
Apparatus for punching, and repeating machine for cards used on jacquards for lace machine and weaving looms. E. Roe and G. Kent, Calais.	4th May	6,006
An appliance for cleaning the upper portion of ring-spinning frames. F. W. Whipp, London.	7th May	6,193
A tension apparatus for spinning machinery. J. C. Mewburn, London.	8th May	6,250
Belting for driving machinery. D. Jackson, Ashton-under-Lyne.	30th April	5,869
Belts for pulleys, &c. W. P. Thompson, Liverpool.	30th April	5,873
Belts. W. L. Teter, London.	11th May	6,374
Balance apparatus for ascertaining and classifying counts or numbers of the yarn, &c., from which any fabric has been made. H. B. Barlow, Manchester.	19th May	6,703
Bobbin winders. H. Lefeber, London.	22nd May	6,927
Composition for dressing cotton, &c. E. Edwards, London.	3rd May	5,987
Carding engines. T. Knowles, Manchester.	7th May	6,204
Construction of frame for economising space in packing seal-skins and other pile fabrics. H. Lister, Huddersfield.	10th May	6,280
Carding engines. G. and E. Ashworth, Manchester.	18th May	6,639
Card-clothings of machines for carding wool. A. J. Holden, Paris.	22nd May	6,884
Cutting machines for cloth finishing. J. Sunderland, Huddersfield.	24th May	6,937
Carding fibres. G. Goldthorpe, Halifax.	24th May	6,944
Chemically treating rags and waste materials of silk, or combinations of silk with other animal or vegetable fibre. J. Priestley, Wakefield.	24th May	6,946
Dyeing yarns. A. M. Clark, London.	5th May	6,116
Doup heads for guaze fabrics and ordinary heads. J. Kershaw, Bradford.	12th May	6,390
Dyeing or otherwise treating hosiery. H. Broadbent and A. E. Hawley, Halifax.	13th May	6,435
Dobbies or shedding motions of looms. E. Brook, London.	22nd May	6,914
Finishing velvets, &c. R. Dutton, Salford.	6th May	6,123
Fancy pattern cloths, and circular knitting machines therefor. R. H. Lendrum, D. Dyth, and E. Lloyd, London.	7th May	6,219
Hardened and tempered cast steel needle-pointed teeth used in silk combs for the dressing of waste silk. L. E. and G. F. Priestley, Halifax.	12th May	6,381

Internally fed circular combing machines. J. W. Bradley, Bradford.	11th May	6,374
Letting-off motion for looms. L. Clement and N. Cork, Halifax.	6th May	6,130
Lubricants. F. P. Warren, Cosham.	7th May	6,172
Looms. C. Bowles and W. Cairns, Belfast.	13th May	6,439
Letting-off motion for the terry or pile warp in looms for weaving looped fabrics or terry fabrics. H. Barton, Jr., Manchester.	15th May	6,524
Method of, and apparatus for, oiling wool, &c. J. Campbell, Bradford.	15th May	6,537
Machines for preparation of textile materials. A. Dronsfield, Manchester.	18th May	6,638
Mountings for loom temples. W. Tarbotton, Bradford.	20th May	6,760
Milling machinery. Messrs. Garside, Halifax.	22nd May	6,895
Open work borders in linen and cotton towels, produced by weaving in a loom. R. H. Reade, W. Kennedy and T. F. Bell, Belfast.	1st May	5,922
Operating the picking tappit, facilitating turning the pattern mechanism and working drop boxes of looms. A. Sowden, Halifax.	15th May	6,523
Operating the pattern mechanism of looms. F. W. Jepson, Halifax.	17th May	6,592
Operating shuttle boxes and treadles in looms. W. Longbottom, Halifax.	20th May	6,783
Preparation of fibrous vegetable substances for textile purposes. W. Saunders, London.	1st May	5,941
Pressing woollen and other woven or felted fabrics. G. H. Nussey and W. B. Leachman, London.	8th May	6,264
Pressing and ironing cloth, &c. W. Bash, M. A. Prensian and S. Bash, London.	14th May	6,516
Polishing and drying yarns, threads, &c. W. G. Bywater, and T. B. Bealand, Leeds.	26th May	7,044
Removing thistles, burs, &c., from wool. W. H. Beck, London.	8th May	6,267
Ring spinning and doubling machines. S. Brooks, London.	20th May	6,775
Reversing motion and automatic brake for burl dyeing machines. E. Wood, Hunslet.	22nd May	6,878
Spindles and means of joining and securing them, especially applicable for driving tape frames. J. Lee, Halifax.	4th May	6,030
Shuttles. E. G. Brewer, London.	4th May	6,052
Spinning machinery. T. F. Wallwork, Manchester.	5th May	6,078
Spinning and doubling cotton, &c. T. Ashworth, Manchester.	5th May	6,079
Single or double lift dobbies. B. Bridge and J. A. Calvert, London.	6th May	6,131
Spindle mountings for spinning machinery. J. M. Hetherington, Manchester.	6th May	6,135
Shuttles. E. Haworth, Halifax.	7th May	6,195
Shuttle-guard. P. H. Marriott, Manchester.	12th May	6,380
Sizing, drying and warping yarns. W. G. Bywater and T. B. Bealand, Leeds.	13th May	6,427
Shuttles. J. Hardwick, Bradford.	14th May	6,483
Sectional warping and beaming machines. J. H. Stott and J. Smith, Manchester.	15th May	6,548
Shadening or flaking the pile of silk plush fabrics. T. Salt, London.	17th May	6,595
Sectional warping mills. H. Stott, Halifax.	20th May	6,767
Stop-motion for looms. F. Paas, London.	20th May	6,797
Shuttle peg, specially adapted for use with bobbins or pirns. R. Martin, London.	22nd May	6,915
Spinning, doubling or twisting machinery. J. W. Midgley, Skipton-in-Craven.	24th May	6,940
Preparing and weaving wet or sized cops. J. Ahlstedt, Manchester.	27th May	7,108
Tubes or bobbins used in roving, slubbing and spinning of cotton, &c. J. Whalley and J. Pickup, Halifax.	30th April	5,863
Twist lace fabrics. J. Coxon, London.	1st May	5,939
Tubes, spools, bobbins, rollers, skewers and picking sticks used in machines for preparing and manufacturing cotton, &c. S. Wilson, Manchester.	18th May	6,634
Twist lace fabrics. J. Coxon, London.	26th May	7,063
Weaving elastic fabrics. L. Turner, London.	8th May	6,252
Winding or folding and boxing braids, laces, ribbons, &c. A. Butler, Bradford.	10th May	6,276
Weaving elastic fabrics. C. H. Gray, London.	21st May	6,861
Woven figured fabrics. T. Taylor and J. Warburton, Manchester.	24th May	6,932

### Patents Sealed.

4,668	5,128	5,407	5,504	5,613	5,998	6,594	5,625
5,894	6,377	4,894	4,977	4,979	5,371	5,709	6,022
6,026	15,038	1,414	1,525	2,907	3,504	5,335	6,636
800	1,128	1,576	1,687	6,375	6,390	7,368	9,533
1,806	1,897	3,704	5,941	14,393	1,927	1,928	1,939
706	3,455	3,725	5,710	5,726	6,331	6,549	7,772
2,040	2,197	2,206	2,227	6,420	6,877		



# The Journal of Fabrics AND Textile Industries.

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	An Improved Compound Fixed Engine.

## Notices.

The Yearly Subscription—payable in advance—including home postage, is 10s., Cheques and Post Office Orders to be made payable to H. & R. T. Lobb, 10, Ann Place, Little Horton Lane, Bradford, Yorkshire.

The Publishers will be happy to receive intimations of New Inventions, Patents, &c. The Publishers are open to receive, from Designers, Original Designs of Carpets, Damasks, Tapestries, Linens, Cretomes, &c., and such as are accepted will be published with the Designer's name affixed. All Designs sent for approval must be 10 inches long by 7 inches wide for single page, and for double page, 16 inches by 10 inches, and must be accompanied by Postage Stamps sufficient to pay return Postage in case they are rejected.

Literary communications must, in all cases, be accompanied by the names and addresses of the writers, not necessarily for publication, but as evidence of authenticity. Authors are requested to retain copies of their manuscripts; rejected manuscripts cannot be returned.

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Readers are invited to forward items of interest to the Trades concerned. The Proprietors will feel greatly obliged if any of their readers, in making enquiries of, or opening accounts with, Advertisers in this paper, will kindly mention the *Journal of Fabrics and Textile Industries* as the source from whence they obtained their information.



In consequence of the General Election and the unavoidable excitement and engagements resulting therefrom, we have not found it convenient to give our third plate of "Eminent Textile Men" during the past month, we have, therefore, occupied the page by a design for a Brussels Carpet.

## Cloth Selvages.

**I**N the manufacture of cloths, which are made otherwise than by the plain tredding of the healds, some special arrangements are usually necessary to secure a plain selvage, or, at any rate, one which, when the cloth is finished, will be a good substitute for a plain selvage. When stripes are being woven, in which the ground is plain cloth, the shafts which make the ground may be utilised for making the selvage—care being taken in designing the pattern to so arrange that the first and last stripe shall be equi-distant from their respective selvages. In other fancy cloths, it is sometimes possible, by using two or more of the shafts, to make a suitable selvage. These are matters for the designer, and should never be forgotten when designing a pattern for striped cloth. In jacquard weaving, it is usual to reserve certain needles for the formation of the selvage. In these cloths, therefore, no further special arrangement is necessary. But in three and four shaft drills, where one heald only is raised or depressed at one time; in five shaft sateens, in matting, serges, oatmeal, mock crapes, and a

variety of other cloths, it is absolutely necessary to have some arrangement by which a different selvage from the body of the cloth may be made. The old plan was the addition of skeleton shafts to the shafts required for weaving the body of the cloth. Skeleton shafts are shafts on which healds only are knit when required for raising or depressing the selvage ends. Up to within a few years ago, it was usual to make these healds of the same yarn, or similar to that used for the ordinary healds, but, it being found that the great strain upon the few healds, placed upon these skeleton shafts, caused them to wear out long before the healds upon the other staves, thus resulting in loss to the manufacturer, it is now usual to employ selvage mails—that is, healds containing metal eyes, which, when properly made, last a very long time. In many cases, however, it is impossible to use skeleton shafts without the addition of some arrangement to actuate these shafts, for instance, in making three or four shaft drills, and five shaft sateens, where motions exist which only provide for actuating three, four, or five shafts respectively.

When this is the case, it is obvious that some further arrangements are necessary. One arrangement for this purpose is the addition of two small plain tappits to the tappit shaft, these tappits are cast in halves for convenience of application. They are placed just under that point where the selvage ends will come. Two small treddles are actuated by each of these tappits, and these treddles, in their turn, actuate the skeleton shafts. Where a spring top is used, the top staves may be attached to two of the jacks, should there be any not previously employed, or arrangements may sometimes be made to attach them to a long heald roller. In some cases, only one plain tappit is employed. This tappit is, of course, fixed upon the tappit shaft, whilst the three, four, or five, leaf tappit is upon the twill shaft. When this is done, some care is required in designing the tappit. In all cases where strong selvage ends are used, the skeleton shafts should be placed behind the other shafts, and not before. When two small tappits are used, skeleton shafts are sometimes done away with, and the selvages are made by a harness arrangement. The selvage healds are threaded through small comber boards, which are attached to the loom side or loom top, similar to those used in making fancy bordered dhooties, and either connected at the top with two of the jacks of a spring top, or else with elastics. Another variation of this plan is to have only one pair of these tappits at one side of the loom. The mail healds are connected with two of the jacks of a spring top. These jacks, of course, actuate their fellow jacks to work the selvages on the other side of the loom to which other mails are also attached. These sets of mail are connected to elastics or springs at the bottom of the loom. The great objection to the last two arrangements is that it is necessary to use a considerable quantity of heald cord, which has the unsatisfactory property of being subject to the changes in the weather. It is needless, probably, to point out that, as this is the case, the loom overlooker may have considerable work in readjusting the selvages of his looms when a moist atmosphere has been replaced by a dry one, or *vice versa*. Recent investigations and experiments have, however, shewn that it is possible to make heald cord so that it is almost impervious to the weather, but as the arrangements by which this cord is made are not perfected, it is probably better not to enlarge upon this point. Another method very usually employed to make a bastard plain selvage is what is called the boat system. Between the healds and the yarn rods, two pieces of hard wood, one at each side of the loom, are placed upon a round wrought iron bracket affixed to the loom side. These pieces of wood are so fixed that each end can be swayed up and down from the centre of the wood, giving a motion like that of a boat—hence the name. The boats are placed under the warp—the distance being regulated by the length of the wires placed at each end of the boats. These wires are usually made of reed wire bent double and fixed in slits at the ends of the boat. The number of wires is regulated by the number of selvage ends required. Half the selvage ends are drawn through the back, and bent wires are drawn into the healds of the two back staves only, above the eye, and not in the eye, as is usual; and the ends which are drawn through the dents in the front



of the boat are drawn through the healds on the front stave, but always above the eye of the heald, and not through the eye. This system is a very inexpensive one to apply. It makes a selvage as follows:—Three shaft drill, one pick in a shed, two picks in a shed; five shaft sateen, one pick in a shed, three times repeated, two picks in a shed. Where boats are used, very strong selvage ends are necessary, else the selvages will weave very badly, and much time will be lost by the weaver. The healds also are found to wear out very soon at those parts used by the selvage ends. The weaver has also to draw the selvage ends in at the loom. Where sufficient room in the loom exists, the tappit arrangements would seem to be in most respects superior to the boat plan, and, where manufacturers order looms for the weaving of fancy cloths, care should be taken to make such arrangements as will permit of their adoption if required.

### Edinburgh Exhibition.

The Exhibition in Edinburgh continues to draw numerous visitors, the great variety of exhibits causing much interest to be shown, as there is something pleasing to all classes. Our textile manufacturers will, of course, pay most attention to those things coming within the scope of their business. We have, therefore, noted such goods only as appear to us most suitable to the readers of these pages. The Dunfermline linen manufactures are well represented. They include table linen, sheeting, towelling, diapers, crumb cloths, coloured table-covers, bed-quilts, &c., the chief contributors being J. & T. Alexander, W. Cunningham, J. Mathewson and Sons, Beveridge, Erskine and Co., Hay and Robertson, Wilson and Reid, Inglis and Co., J. and G. Marshall, A. Reid and Co., H. Reid and Son, and Steel and Co. Lang and Co., of Glasgow, show High Art, Oriental, Crete and Madras curtains, bed-covers, table-covers, &c., in process of manufacture and the jacquard loom at work. The Clydesdale Silk Manufacturing Co., Glasgow, have a most interesting exhibit, consisting of silks from the mulberry leaf to the cloth, showing the hatching and rearing of the worm, the forming and reeling of the cocoon, raw and thrown silk, and all kinds of sewing thread both for the machine and hand. John Shields and Co., Perth, exhibit specimens of the various productions of the linen manufacturer, amongst which may be mentioned very handsome bleached, cream, and loom damask table napery, crumb cloths, stair damasks, and coloured cotton covers. Shaw Bros., Kirkcaldy, show flax in the various stages of manufacture, as well as samples of grey and bleached yarn. Conspicuous amongst the cotton manufactures are the productions of Swainson, Birley and Co. of Preston, who exhibit broads, plain and fancy muslins, sateens, &c. Middleton, Jones and Co., Limited, show a case of velvets, and velveteens. Munro and Co., Shetland shawls, Fair Isle goods and hand knit knickerbocker hose, &c. John White and Co. have a most interesting collection of hand-knitted Shetland wool goods, comprising very beautiful lace shawls, scarfs, &c. The Galashiels Manufacturers' Corporation exhibit, represents the staple trade of Galashiels and the raw materials used. A. and J. Macnaughton, woollen manufacturers, Piddochry, show the tweeds named from the place, plaids, rugs and Clan tartans, together with other Highland wood fabrics and exhibits of home made goods as produced from the growers' own wool. Robert Houston and Sons, Greenock, show Scotch Cheviot tweeds, A' 'oo' Harris, tweeds, &c. M'Lintock and Sons, Barnsley, exhibit a variety of down quilts and clothing. H. C. McCrea and Co., Limited, Halifax, have an exhibit consisting of curtains, table cloths, and upholstery goods in tapestry of silk and other materials; damasks of silk and wool, mohair and wool, and all-wool, as well as repp in all-wool. Bradford is represented by the Bradford Manufacturing Co., and shows various classes of dress fabrics, prepared for serving the public direct from the loom. Wm. Wilde, silk manufacturer of Macleesfield, exhibits a silk loom for weaving handkerchiefs, &c., and the Ford Mill Co., Langholm, Scotch tweeds, maids and rugs. R. Richmond, Ayrshire Blanket Factory, Galston, shows home-made Ayrshire blankets manufactured from the finest selected home-grown wools, as well as plaidings and sheetings, and Fraser and Smith, Inverness-homespun, cheviot, cashmere, &c., tweeds and wool-yarn, as well as tweeds in various stages of manufacture. Smith, Bros. and Co., Paisley, exhibit tartan plaids and shawls; and R. Leggett and Son, Water of Leith, Edinburgh, different classes of home and foreign skin wools; whilst Borthwick and Ingram, Hawick, show Scotch tweeds for home and foreign markets; J. Lornie and Sons, Kirkcaldy, linen goods, including bleached damask tablings and napkins, diapers, glass cloths, &c., &c. The manufacturers of carpet who are exhibiting are J. Templeton and Co., Glasgow, Axminster carpets and rugs; Blackwood Bros., Kilmarnock, art squares and other Kidder carpets and rugs; and J. S. and S. Smith, Glasgow, patent-ingrain art squares and yard-wide carpets, with two piles of warp and extra wefts. The manufacturers of oil-cloth and linoleum are represented by the Kirkcaldy Linoleum Co., Limited; Hendry, White and Strachan; M. Nairn and Co., and Tait, Cairns and Co., Limited, of Kirkcaldy. In addition to the above mentioned exhibits are some pleasing specimens of decorative or useful needlework contributed, or exhibited, by women, amongst which we will mention the "Tusser-ou-Tusser" embroidery (wild silk of India), by Miss

S. J. Templeton; the Kell's embroideries and lace, by Mrs. Ernest Hart; Irish silk guipure, exhibited by Hayward, 166 and 168, Oxford Street, London; two embroidered beds, a chair, curtains and pieces of embroidery, by the Wemyss Needlework School; carding, spinning, dyeing, and knitting practically shown, by three girls from Shetland, and three from Fair Isle; artificial flower making practically shown by three girls. The Decorative Needlework Society shows several pieces of ornamental needlework; a case of plain needlework and knitting is exhibited, it was selected at the preliminary exhibition, (April) from Normal Colleges, Elementary Schools, Girls' Schools, Institutions, and Individuals; and last, but not least, and to which we would especially direct the attention of those of our readers who intend visiting the exhibition, we may mention the Irish Women's Industry Stall, containing a great variety of useful and decorative articles, including plain and fancy needlework, laces, embroideries, knitted goods, linens, homespun, umbrellas, soap, matches, &c., &c. The exhibits in the "Women's court" are far too numerous to particularize, but each and all are worthy the position they occupy in the exhibition of the Scottish capital. There is not a great variety of machinery of interest to textile manufacturers, and we shall, therefore, not allude to this section at any length. Those deserving of mention are as follows:—Messrs. Platt Bros. and Co., Limited, Oldham—Machines used in the French system of preparing and spinning worsted yarns; power loom for weaving tweeds and fancy worsted goods; patent double action Macarthy cotton gin, worked by hand, and with hand feed; and machines for spinning warp and weft yarns. Messrs. Hutchinson, Hollingworth and Co., Dobcross, near Oldham—Knowles' patent open shed fancy loom, to run at a speed of from 75 to 90 picks per minute. This loom was explained by us recently in an article which appeared in this Journal. Mr. George Hodgson, Thornton Road, Bradford—Various kinds of power looms for weaving different classes of cloths. Henry Pease and Co., Darlington—Power loom for weaving dress fabrics. Messrs. J. and J. T. Templeton, Crownpoint Road, Glasgow—Melton carpet loom. Inglis and Co., Dunfermline—Linen damask loom. Blackburn Air Propeller Ventilating Company, Limited, 57, Fore Street, London, E.C.—Air Propeller, driven by power, for ventilating, cooling, or drying. We gave an article upon this machine in a recent number of this Journal. Messrs. Schofield and Kirk, Huddersfield—Power loom for fast weaving. Messrs. W. and J. Galloway and Sons, Knott Mill Ironworks, Manchester—Galloway patent boiler, 300 indicated horse power. Messrs. Watson, Laidlaw and Co., Dundas Street, Kingston, Glasgow—The Weston patent suspended self-balancing hydro-extractor or centrifugal drying and separating machine for wool, yarn, cloth, clothing, &c.

### Wool in the Indian and Colonial Exhibition.

In a former issue, we referred briefly to the textiles exhibited in the above named exhibition, but, in consequence of the limited space at our command, we made no mention of one of the most interesting (to our woollen and worsted manufacturers), features of the Australian division, viz., wool. Commencing with New South Wales, the mother colony of Australia, we at once plunge into the midst of wools and fleeces of the most diverse characters and qualities—Angora mohair, Australian merino, Saxon merino, and commoner sorts. There are about 80 exhibits of fleeces—a far larger show than is made by any other class in the New South Wales Court. Messrs. Chisholm Brothers, of Kippilaw, Gouibourn, exhibit half-a-dozen fleeces, fine combing, from 18 months old ewes descended from rams imported from Silesia in 1851. The Collaroy Company show a 14lbs. ewe's fleece of 12 months' growth. The average clip in the colony is from 5½lbs. to 6½lbs. of greasy, and about 3½lbs. of washed wool. The tendency of the South Australian climate is to gradually add to the length of the staple of Austrian and German rams, without much increasing the stoutness of the fibre, whilst it retains, at the same time, its soundness, softness, and colour, and even improves in that lustre and fineness which make a combing wool specially valuable. The coarse-woolled sheep are chiefly found in the coast districts, where they thrive better than the merinos. The production of wool in New South Wales has been largely increased by fencing and subdividing the runs, utilising the outside country, and providing a better water supply by means of dams and reservoirs. While in 1851, South Australia's export of wool was but 15 million lbs., in 1884 it was 174 millions. And 98 years ago the colony contained just one bull, four cows, a calf, and a few sheep, then newly landed from England. Now New South Wales counts 38 million sheep alone, and is rapidly attaining to wealth, "beyond the wildest dreams of avarice," by shearing her flocks at the rate of a quarter of a million head at a time. It has required some sixty years to bring the flocks of New South Wales to their present condition of perfection. Oddly enough there is but one exhibit of woollen goods, and that is shown by the Colonial Commissioners for the exhibition. Furs and skins make, however, a fair show. In the Victoria Court, there is a large and important collection of wools, as well as in the South Australian division. Stock-raising interests naturally occupy a prominent place in the Queensland Court, since this, the youngest of all the Australian Colonies, possesses four and a quarter million head of cattle, and nearly ten million sheep. In the New Zealand Court, wool is the most important and best represented product.



### The Fashions Magazines.

Sateen, which was hardly worn at all last year, is again in fashionable favour, and some of the designs are worthy, in form and colouring, of the richest silks. The blending of plain and pattern obtains in every possible class of dress and material. We must not forget to mention the fashionable vogue of beaded grenadines; these are very elegant, and far more serviceable than they appear, the grenadine ground being very strong, and the beads woven in it. This elegant material is much liked for combining with black silk, satin, faille française, and Irish poplin; it is very effective also with black velvet.—*Le Follet*.

White costumes are popular in every kind of material, and one of the most favoured fabrics is fine white book muslin elaborately embroidered. Bright colours, such as red and yellow, are also to be seen, but these require to be worn with great discretion. Red and heliotrope are favourite colours. The printed China silks and corahs make most effective gowns, they are made with a border, which would edge the drapery, sleeves, and trim the bodice by bordering a V-shaped plastron of lisse or spotted net. Foulard is very fashionable, and may be had in pompadour designs, with coloured floral sprays. Crêpe is a most useful material, the groundwork is usually white, with small coloured cross-bars of frisé raised on the surface. A new kind of cream canvas is embroidered with sprays in cashmérienne colouring, a deep border round, with a heavy knotted fringe at the end. Cream canvas will also be trimmed with embroidery in wool or cotton. This embroidery will be very much used for children, as well as for young girls and elderly ladies. For the former the colours will be blue, red, pink, and all bright shades. For the latter, shades of seal brown, or a dark shade of blue or garnet. Cotton dresses are to be had in great variety. A novelty in the way of a wrap for a thin gown, when the sun goes down, and the evening gets chilly, or to wear after playing tennis, &c., is to throw round the neck a wide scarf of pale coloured Indian or Chinese silk, or of soft muslin.—*Ladies' Gazette of Fashion*.

There are several new guazes intended for summer toilettes, which are suited for day or evening wear. Some are woven with tinsel threads, in silver, gold, and other colours, which adds a good deal to their effect, but at the same time necessitates great good taste in using them, or "loud" effect would be produced. Mousseline de laine and other thin materials are worn largely, preference being given to the dresses à disposition, i.e., those with the bands of trimming woven with the material. Other mousseline de laines are figured all over, either in pompadour patterns, oriental, or geometrical designs. Striped materials of all kinds are very much worn, and seem to take the precedence of spots or floral designs. These stripes are frequently, not only of a different colour, but also of another texture to the accompanying material. For instance, the newest make of canvas is striped with chenille, or with plush; velvet is striped with satin, or moiré; silk with plush; broché with plain silk; lace with plush, satin, or velvet, and so ad infinitum. Nor are these striped effects confined to rich materials and woollens only; they are equally observable in the thinnest fabrics, as grenadine striped with lace, barege striped with silk or satin; and in gauze and lace fabrics the variety is greater still. In cottons, the stripes are legion, wide and narrow, plain and frisé, ribbed and curly, cotton and lace, until it would appear that invention can no farther go. For evening wear, tulle holds its own, and even in tulle, stripes appear with excellent effect. Crape, areophane, and lisse, in their many varieties, are in great favour for evening dresses, especially those which are embroidered in the old tambour fashion. These made up over silk or satin, form the softest looking toilettes possible, and are universally becoming. There is a strong tendency in favour of a more liberal mixture of decided colours than has obtained for some time past. Instead of "harmonies," i.e., various shades of one colour, Dame Fashion delights now in contrasts, and it would appear that no mixture is too eccentric for use at the present moment. We would, however, gently remind our readers that in this matter, as in all others, good taste should have the casting vote.—*World of Fashion*.

### Berlin Dress Goods Trade.

In the export trade there is great activity at present, many buyers being here from the United States, whose orders are very large, as a good winter business is expected from America. England continues to give good orders; both London and Manchester are at present represented by buyers. The home business is very slack. Woollen goods manufacturers are well employed. The lack of goods which was felt a week or two ago continues, however, no longer. The plush branch is well employed on export orders, and the tricot branch is also busy, England, America, and France, having sent in numerous orders.—Steps are being taken at Plauen for the introduction of knitting as a house industry on a large scale, especially for the making of Smyrna carpets. In this connection, it is worthy of note that a new needle of simple form, but of great efficiency, has been patented. Whereas, with an ordinary needle, a knitter can make 170 knots in an hour, with the new one, she can make from 360 to 400 knots.



### Commercial Museums.

Some months ago, we alluded at some length to the question of the Commercial Museums which have been so ably advocated in this country by Mr. Ablett. The following, bearing upon this subject, cannot fail to be of general importance and interest to textile men. We may express a hope that, before long, some active steps may be taken towards the foundation of museums upon such lines as may be deemed most likely to effect the objects aimed at. There are difficulties in the way as we pointed out when last we noticed this question. But surely it is possible to overcome these when not only the commercial community but artisans also would be so greatly benefited by their establishment.

In all that relates to what may be termed the organisation of commercial competition with other nations, the United Kingdom is amazingly behindhand. We have Chambers of Commerce, it is true, but their importance and influence is very much less than in the great cities of France and Belgium, to say nothing of more distant European countries. Then we have the really interesting and useful Consular reports upon the commerce of all the nations of the world in turn, but they are published in the all but inaccessible form of Parliamentary papers. Even the bare fact that such reports are published at all is probably known only to a small minority. Other countries possess commercial schools and institutes in great number—Germany has two or three hundred of them—commercial museums, and other machinery for circulating among traders the accurate and detailed information without which it is impossible to open up export business. In the present exceedingly serious position of British trade, when business is being snatched from us at every turn by enterprising and instructed foreigners, it is important that we should possess a clear idea of the means whereby France, Germany, and Belgium, with some countries of smaller commercial importance, extend their export trade, mainly at the expense of Great Britain. Foremost among the means are the commercial museums which are plentifully scattered all over the continent. It is to Belgium, always keen and enterprising, that belongs the credit of establishing the first of these museums. The point of departure was a circular addressed in 1855, by the then Minister of Foreign affairs at Brussels, to the Belgian Consuls abroad, in which they were instructed to send an account of the position of trade in their respective districts, and to devote a special memoir to the trade of those regions with Belgium, illustrated by statistics of imports and exports. The consul was to state explicitly what Belgian goods had gained in favour or what had lost ground; what others might advantageously be introduced and by what means; the reason why certain commodities of foreign production were preferred to those made in Belgium; and the difference of price in the articles which competed most keenly with Belgian merchandise. But the Vicomte Vilain Quatorze was nothing if not thorough and practical, and he went on to instruct his Consuls to send samples of goods, ticketed with the prices usually paid for them in the districts to which the representatives were accredited, and with a statement of the conditions which the merchandise should fulfil to hit the tastes of the foreign customers. The Consuls were, moreover, to indicate the best method of packing the goods, the wholesale prices of merchandise suitable for importing into Belgium, the best times and seasons for sales and purchases, the names and addresses of the principal merchants doing business with foreign countries, and the rates of freight from the Consul's residence to Antwerp, Ostend, the Hanse towns, and the principal ports of Holland, England, France, and Italy. Still more, the Consuls, who, it is clear, must have earned their salaries in 1855—were to transmit to Brussels make-believe invoices as an indication of the annual needs of their respective localities. Unfortunately these instructions were too elaborate, and but little benefit resulted from them. Quantities of samples were sent to the Minister for Foreign Affairs, in whose office they remained neglected for some time. Then they were distributed among the Chambers of Commerce, which ultimately handed them over to the Institut Supérieur de Commerce at Antwerp, one of the best and completest establishments of the kind on the continent. Nevertheless, the seed was sown, and from what had been done and attempted by Vicomte Vilain Quatorze, M. Frère-Orban derived the idea of creating the Brussels Commercial Museum, with the object of doing away as much as possible with the necessity of employing middlemen to bring together producer and consumer, and to serve as a practical guide to exporters. It is complained that this museum of samples is not so extensive as it might be; but its value is more and more appreciated as time passes, and the Antwerp Exhibition last year contained abundant proof that it has not been wholly neglected. Brussels, however, is not a commercial centre, and there is a strong feeling at Antwerp that a similar but more complete museum should be established in that city, which has now, thanks to the energy, the enterprise, and the public spirit of the people, supplemented by the generosity of the Government, become the first port of the continent. This desire is now about to be carried into execution. The handsome pavilion in which the exhibits from Cambodge were displayed



at the great Exhibition of last year has been presented to the Municipality of Antwerp by the French Government, and it is to be converted into a commercial museum at once.

In France, museums of this character are of very recent institution, the Ministerial rescript establishing them bearing date September 11, 1883. In his circular to the presidents of the chambers of commerce M. Charles Hérisson, who was at that time Minister of Commerce, suggested the establishment of *musees regionaux*—collections illustrative of the manufactures and natural products of particular localities. The suggestion was adopted by the Commercial Museums Commission which was appointed in November, 1883, and reported in March, 1884. The object of all commercial museums is tersely sketched in this report. "The object of establishing these museums," remarks the reporter, "is to make known to merchants the foreign products which could with advantage be imported into France; to inform manufacturers and artisans upon the methods of manufacture pursued abroad; and—most important object of all—to furnish exporters with information upon the produce regarded with most favour in the markets of the world. These museums will facilitate to our manufacturers the imitating and the perfecting of articles made abroad, and will place French industry in a position to struggle against foreign competition." The result of M. Hérisson's efforts is that a good number of "local museums" have been formed, while new ones are constantly being projected. At Amsterdam, there is a capital commercial museum, the *Nederlandsch Handelsmuseum*. It is a private speculation, and is supported by the members' subscriptions and other payments. The museum was opened at the end of 1883, and the subscription is, for European members, 16s. 8d. per annum, and for members residing in other parts of the world £2 per annum. In addition to collections of samples, it comprises an "information bureau," a library, and a dépôt for specifications, forms of tender, and the like. Samples are exhibited by a large number of manufacturers and producers, who pay subscriptions varying from 10 to 50 florins yearly, according to the number and the bulk of the articles exhibited. Those who desire only to avail themselves of the museum for seeing catalogues and price lists can obtain them for a payment of 5s. a year. The museum likewise gives—and this gratuitously—information relating to customs' dues and means of transport. In Germany, where the organisation of commerce has of late made such rapid advances, the first permanent exhibition of industrial products was founded at Stuttgart in 1881. Its main object is to furnish foreigners with information upon the resources of Wurtemberg, and it is the property of a society which now numbers 415 members, each of whom pays an annual subscription of £1 5s. This *Export-Masterlager* publishes catalogues printed in German, English, French, and Spanish. In this instance, the leading idea of a commercial museum has been carried a step further; for the society possesses representatives or correspondents in several important foreign towns, through whom it sells Wurtemberg goods. Much has been heard of the floating museum which certain German merchants have lately had cruising in the Mediterranean, but the idea is not a new one in the Fatherland. So long ago as 1883, it was decided to form in Berlin a commercial museum on the model of that at Brussels. It is to have branches, probably at Frankfurt, Stuttgart, and Leipzig, among others. In Italy, there are two commercial museums—one at Milan, the other at Turin. That at Milan is the property of the Local Chamber of Commerce, which charges a small fee to those who make use of its advantages. The well-known Oriental Museum at Vienna is likewise the outcome of private enterprise. As its name indicates, its principal object is to extend Austrian commerce in the East. It is conducted on the lines of that at Brussels. Much information regarding its operations may be obtained from its admirably-edited organ with the terrible name, *Oesterreichische Monatsschrift für den Orient*. The director of the Museum is nominated by the Emperor, while the governing body is elected by the subscribers. A somewhat similar museum, with a more extended scope, is about to be started at Buda-Pesth. Portugal has two museums—at Lisbon and Oporto, which are gradually attaining important dimensions. Both of these are, like so many others, formed upon the Brussels model. It remains only to add that in England the formation of commercial museums has not yet got beyond the stage of "consideration." The Board of Trade has the subject in hand, and apparently does not intend to let it out again.

In connection with the above subject on Commercial Textile Museums, we submit to the consideration of our readers the following letters, written to the Editor of the *Yorkshire Post* by Mr. Alfred Harris, of Kirby Lonsdale:—"With reference to your article to-day on Commercial Museums, I will trouble you with a few lines. I have recently returned from a tour in Wurtemberg, undertaken for the purpose of seeing the progress made in the development of technical and art education since my last visit in 1869. This small kingdom takes the lead among the German States in the practical application of art to industry, and in the businesslike way in which the trade affairs of the country are conducted by the Government, the Corporations, and the people. In the Muster-Lager, or trade museum, in Stuttgart, the buyer can see, in a short visit, samples of all the leading manufactures of the country, and can obtain information as to price, &c., so that he knows exactly where to apply for the goods which he may require. In visiting it, I was astonished both at the novelty and the variety of goods now produced by the manufacturers and handicraftsmen, and at the great progress which has been made in the application of art to industry by this small but industrious and well-organised State. To describe what I saw in

Stuttgart and the provinces, both among the manufacturers and the schools, would require too much space for a letter in your columns, but I may briefly sum up their *modus operandi* in a few sentences:—(1) The department for industrial art is under the care of men who are not mere theorists or sentimental artists, but who understand the requirements of the trading community, and work for their benefit. (2) The Corporation and local bodies work in harmony with the Government Department, and afford liberal assistance to the "Fortbildung" (further progress) and "Kunst-Gewerbliche" (Industrial Art) Schools, and in the support of local museums. (3) The manufacturers and handicraftsmen vie with one another in supporting the schools, and compelling the attendance of their young men and apprentices. (4) The absurd system of paying on results for design and art workmanship does not exist. (5) The teachers are all expected to know the trades of the districts, and to be practical workmen first and teachers afterwards. They obtain their final art training in the chief "Kunst-Gewerbliche" School at Stuttgart, under experienced designers and professors, and are paid according to their individual capacity and not on the work of the students. (6) Pictorial art is kept distinct from industrial art. The two are under different departments, and are both carried to the highest pitch of excellence. I testify with regret that in Wurtemberg they are far in advance of us in the universal application of practical art to industry; and I can inform manufacturers and others in England that we have as yet felt only the effects of the thin point of the wedge as regards German competition in works of artistic excellence, novelty of design, and high finish.

## The Cultivation of Flax in the United States.

From "The Journal of the Franklin Institute," by JOHN SHINN.

(Concluded from Page 65.)

In 1883, Ireland had 95,943 acres in flax. The production of scutched or raw flax was 18,464 tons. To supply the linen mills of the United Kingdom, the imports of that year amounted to 77,347 tons of raw flax. If such are the wants of England, and such prices as the before-mentioned can be obtained for Belgian flax, would it not pay in this country to raise flax for export? It will be said (as, indeed, it has been), that we cannot raise good flax in this country. I will now give my experience on this point. I spent the last three months of 1882 in Belfast, Ireland. This entire time was devoted to collecting practical information on flax and its manufactures. Previous to this time, I had handled much flax, both in the straw and in the "scutched" state; flax that was grown in New York, New Jersey, Pennsylvania, Ohio, Indiana, Illinois, and Oregon. Some of the flax grown in New York State gave the unusually large yield of thirty-three per cent. of long line fibre from "dew retted" straw. Had this straw been properly "water retted," the fibre would have been equal, both for quantity and quality, to any that I saw or handled at the linen mills in Ireland, not even excepting some fancy lots from Belgium, which I was permitted to examine. I have handled flax grown in New Jersey, and water retted, which, for colour, lustre and strength, was equal to the best Courtrai flax. I have examined Oregon flax straw, which I found to be a superior article, giving a large yield of both seed and fibre. I have seen flax straw that was grown in Illinois, and for seed only. The straw was burned, as there was no market for the fibre, and yet this straw was as good and rich in fibre as any that I tested, which was grown in Ireland. If it had been properly water retted, it would have produced a first-class fibre. If properly retted, all flax fibres are fine. This can be proved by any one who will take a strip of flax bark, in the green, unretted state, place it in the mouth, and, by chewing gently for a short time, the glutinous matter will be found well dissolved out (saliva being a good solvent, next to the gastric juices). The fibres will be found finely divided, perfectly white, and, while wet, easily parted by the thumbs and fingers to any desired length. This little experiment alone has often been the means of removing prejudice, and proving that fine linen can be made from what is called coarse flax, such as is grown for seed only, if only the straw is properly water retted. The question now is, what is "retting?" Flax straw, after the seed has been removed, plainly speaking, consists of three parts—sap, fibre and "boon." The only valuable part being the fibre, the sap must first be dissolved out, and this can only be done, without injury to the fibre, by fermentation, after which fermentation the straw must be washed and thoroughly dried, leaving the fibre and "boon," the latter of which is removed by breaking and scutching, leaving the fibre free from the boon or shives. To get rid of the sap without injury to the fibre, colour, lustre, strength and nature, is the object of steeping and retting. Several persons, at various times, have advanced the idea that this could be done, and flax "cottonized," by putting the straw through a number of processes of steeping and boiling in solutions of caustic soda, sulphuric acid, or other chemical reagents; but all have failed, owing to the fact that the use of chemicals, and even the boiling, destroys the strength, lustre, and what



the Irish call "nature of the fibre." Such was the case with Clausen's, Schenck's, Knowles', and other processes. The writer, while in Ireland, visited a town called Dunmore, to see some flax that had been so treated. The place had been fitted up, at a large outlay, with iron tanks, pipes, baskets, and machinery for scutching. The processes having proved a failure, the place was idle and the machinery for sale. There was a large lot of straw on hand that had been operated upon, which did not look bad. I went to a linen mill close by and had a conversation with the superintendent. I wanted to know the trouble. To use his words, "The flax is dead; it has no 'nature'; it will not spin." There were several tons of flax straw at the place which had been so treated, and which was for sale at any price that might be offered. It was worthless, and would not sell for tow. In order to preserve the natural oil in the fibres (which is called the "nature") the flax straw must be kept from all corrosive alkalies, acids and boiling water.

This may be done by having the steeping tanks in a warm building, heating the water by steam in a separate tank, keeping the room warm by steam pipes around the room. This will ensure a uniform heat throughout the steeping tanks, and the process of retting will not be checked by cold nights or wet days, and the process may be carried on summer and winter. The retting will be under control, and there will be no over-retting, as is often the case with dew retting, when the flax cannot be taken from the fields while wet, and it often happens that the flax is not only "retted" but *rotted*, the natural oils in the fibre, and the lustre being destroyed. Flax straw, that is uniformly water retted, will scutch well, the fibres will be free from shives, and, if used for long line, will make less tow in heckling, and will spin well. As most of the gum is dissolved out without loss of the "nature," the goods will bleach at less cost and have more gloss and strength than flax poorly retted. If tangled straw, such as is grown in the West for seed, be used and run through the common grain thresher, the straw will be well and uniformly retted, the fibres of good colour and strength, fine and glossy, with plenty of "nature." The ultimate fibres of flax are short, not long, as some suppose. They are only from one to two inches long, being lapped or shingled upon each other in the progress of growth, forming long hair-like filaments, which latter many have mistaken for the ultimate fibres themselves. Take the finest fibre of flax that is visible to the naked eye. Under a microscope, each filament is a bundle of extremely fine short fibres, lapped upon each other as before stated. This can be easily demonstrated by any one who will take a thread from a new piece of linen, untwist the thread, and moisten upon the tongue the thread or long filament. When exposed for a few minutes to the action of the saliva, the points of the short fibres may be seen starting from its whole length when gently drawn between the thumb and finger. It is a curious fact, though contrary to general belief, that these fibres are equally fine, so far as can be ascertained by the use of the microscope, whether from what appears to be fine or coarse flax. The difference between what appears to be fine and coarse flax, such as is grown for seed only, is this—in that which appears coarse, the filaments are so firmly cemented by the glutinous matter as to be separated only with some difficulty, but this may be overcome by proper water retting. If the flax is well water retted, and free from gum, the filaments can be separated mechanically into short fibres, producing the long-sought "cottonized" flax; so that flax fibres may be spun into smooth fine yarn without passing the filaments through hot water. With the spinning wheel, in hand spinning, hot water is not used, and to show that fine spinning has been done by hand, the following is published as an account of an extraordinary feat in hand flax spinning:—"Miss Ann Macquillan, of Comber in the County of Down, Ireland, in about the year 1815, from a parcel of flax grown in the barony of Castle-reagh, spun, on a common wheel, yarn running up to sixty-four hanks, or 220,400 yards to a pound. She prepared the flax after her own peculiar system, by dividing the fibres with a fine needle." Undoubtedly this flax was well water retted, and free from gum, and this flax was spun without hot water. Many other such instances could be given where fine yarns were spun by hand, and no hot water used. We have no knowledge that the Egyptians used hot water, yet we have the knowledge that they did spin fine, smooth and strong flax yarns. I advocate keeping the fibres and spun yarns out of boiling or hot water, until it is made up into cloth, and then, if it can be bleached without hot water, the greater and more lasting will be the lustre and strength of the fabric. When I was in Ireland, the manufacturers in Belfast said that we could not make fine linens in America. I inquired the reason. They replied that we "had no climate." I asked, if they had one? if so, I had not seen it. The flax spinning mills of Ireland are kept warm by steam. I was in one in December, 1882, an unusually cold day. As soon as I entered the spinning room I made the remark, "How hot!" and I noticed that the windows were open at the top. I enquired the temperature of the room, and the superintendent, who was with me, informed me that the Government restricted the temperature to 80°, but he did not say what the temperature of the room was. I noticed that the water in the tanks of the spinning frames was quite hot, and in some of them actually boiling, being heated by steam. From this, one can see that, in Ireland, to enable them to spin flax the year round, they must make a climate by the aid of steam. We can do the same. That we have no good flax grown in this country, and that we have not the proper climate to make fine linens, is nonsense. Professor Waterhouse, of the Washington University, St. Louis, on the subject, says:—"Americans ought

to surpass the rest of the world in the culture and manufacture of flax. With our wide range of latitude, the conditions of soil, temperature and moisture, best suited to the growth of this plant, can easily be found. But this country ought not to be contented to raise flax merely for the sake of the seed; the largest profits are derived from the manufacture of exquisite fabrics, consequently the attention of our farmers should be directed to the production of long line, fine fibre. Our countrymen, often victorious over foreign art, need not hesitate to enter the list of competition. Surely, American ingenuity is not inferior to Irish skill. Our own mills will yet equal the woven miracles of European looms, enrich the nation with vast values, with which the creative power of skilled labour invests raw material, and retain in the United States, the golden treasures which are now exported for foreign fabrics." The late Peter Cooper, in a letter on home industry, says:—"Economists justly ascribe England's wealth to its mills, indicating the time when those of Dundee and Manchester may be transferred to the valley of the Mississippi, we becoming the manufacturers and merchants of the world. Why wait for England's extremity, before sublimely illustrating the axiom that

"Westward the course of the empire takes its way."

Our country, at present, is just emerging from a great industrial and economical revolution; all classes of manufacturing industry were languishing, especially those of cotton and iron; yet never in the history of the country was capital so plentiful and cheap. The New York City banks alone lately reported a surplus above the legal reserve of over 70,000,000 dols. There is no reason why we should not employ some of this surplus capital and establish a home industry in the manufacture of linens, worth at least 50,000,000 dols. annually, giving employment to thousands, bringing the farmer and manufacturer close together, and the nearer the better? Agriculture gives to manufacturers food and raw materials; manufacturers furnish to agriculture clothing, tools and a home market; domestic manufacture animates and vivifies the production and interchange of commodities; without one, the other languishes and dies. "The nation which begins by exporting only raw products of the soil, must, in the end, export or starve its population." They will find that their markets are too far off, and going further and further, they will find they have lost most of the value of their crops in the cost of transportation. This is why good flax is burnt in the West, and corn is used there for fuel. With these facts and circumstances before them, it might be well for capitalists to direct their attention to the subject, in order that they may reap the manifest advantages which may be derived from the cultivation of flax and from its manufacture into linens for a home and foreign market.

### Spinning and Weaving in Alsatia.

The position of the Upper Alsatian spinning and weaving industry (says Kuhlows) is represented in no favourable light. Many spinners have been compelled to restrict work in order to prevent the further growth of their large stocks. Prices have also fallen very considerably. The chief injury sustained is, however, due to English and Swiss competition. An improvement of the situation is expected from the construction of a canal from Strasburg to Ludwigshaven. The business in woollen and mixed stuffs tend in the direction of fancy and fashion articles. The heavy stuffs of common wool, with an addition of yarns, are in especial favour. The soft wool for which Alsace, and especially Markirch, was formerly famous is now quite neglected, having been replaced by hard wools obtained from England and France. On account of bad trade, a fall in price has also occurred. The position of the cloth manufacturers has not changed, though the increase of duties in Austria, Russia, and Spain, has made export less remunerative. The chief sale used to be to France, but, since 1870, it has fallen off almost completely, and the ground has not been made up in the German markets.

### Commercial Failures.

According to Kemp's Mercantile Gazette, the number of Failures in England and Wales gazetted during the four weeks ending Saturday, June 26th, was 344. The number in the corresponding four weeks of last year was 349, showing a decrease of 5, being a net increase, in 1886, to date, of 203. The number of Bills of Sale published in England and Wales for the four weeks ending Saturday, June 26th, was 1,050. The number in the corresponding four weeks of last year was 1,046, showing an increase of 4, being a net increase in 1886, to date, of 209. The number published in Ireland for the same four weeks was 83. The number in the corresponding four weeks of last year was 65, showing an increase of 18, being a net increase, in 1886, to date, of 152.



## ORIGINAL DESIGNS.

Our first plate contains a handsome sketch for a Brussels Carpet. It has been drawn by our well-known contributor, Mr. George Lees, of Kidderminster. The carpet might be produced in the following colours:—Ground, dull Peacock Blue; Ornament in Indian Red, Fawn, Olive Green, and Black.

Our second design, which is the work of Mr. F. Layton, Halifax, is intended for a Tapestry Border in the Persian style of ornament, and would be very effective in Light Brown and Light Red figures on a Cream, Slate, or Black ground.

Our third plate represents a pattern for a reversible Tapestry Quilt of three shuttles. We are indebted to Mr. J. G. Bowins, of Manchester, for this pleasing design.



**Wool.**—The London sales have progressed with increasing animation, and the doubts felt, and not unnaturally, even among Continental buyers, as to the stability of so great and sudden a rise, may now, we believe, be considered as finally dispelled. Nearly two-thirds of the supplies have been sold; those, among the foreign trade, who held back at first, now buy more freely, and the home trade, above all, has begun to take something like its usual share in the purchases. The result is a further improvement in various directions, noticeably amongst Australian wools, mainly in scoureds, which, since the opening, have risen rd., and may now be quoted 4d. dearer than in April. Large as this figure appears, it is not unfrequently exceeded. Grease wools have not changed their position, but the advance gained at the opening—proportionately the heaviest in the market—is well maintained. As before, the competition runs chiefly on small-haired wools, and these have, if anything, further improved. The demand for quality is altogether a distinguishing feature of these sales, and may be observed in every variety and description of wool. Crossbreds have also gained by the increased English competition, and the medium grades sell ½d. higher than at the outset. In the yarn and piece branches, no new features can be reported, the tone of the markets has been firm and there have been signs of increased confidence in the future. Prices have had a slightly upward movement.

**Cotton.**—Business has been more or less affected by the political crisis, and, generally, commercial men have been busy in an opposite direction to trade. In the markets in Liverpool, the demand for raw material has been above an average, with prices having a hardening tendency. In Lancashire, there has been quite an average business done in cloth for most markets, except the Eastern, which is still affected through the continued weakness of the exchanges. Quotations have been steadily maintained, but any advance was impracticable, though cotton prices are higher than those registered a week ago. In yarns, manufacturers have bought more freely, but, although spinners are now asking more money, no large buying has resulted at the increased figures. The "Indian exchanges," or rather their instability, have proved a factor that has troubled the action of buyers and sellers, and has interrupted the conclusion of business.

**Woollen.**—The elections have also had their effect on this branch of trade, but, notwithstanding, business has been above an average one for the month. Worsteds of good quality have met with much favour and continue to have a good demand at increased rates, but the prices obtainable are not proportionate to the increase in the prices of wool at the London sales. This fact, of course, rather militates against the trade, and manufacturers are indisposed to book orders except at advanced rates. The lower qualities of worsteds have been rather quieter. Tweeds, of the better qualities, in

good designs and colourings have also met with fair attention, as have also the lower qualities for the clothing trade. The heavy woollen trade has shown more animation, although producers complain that the rates offered for goods are much too low, taking into account the high price of wool. Pilots, naps, and such like goods, have had more than an average demand, and the prospects of the trade seem much brighter than for some time past.

**Linen.**—Business, both for the raw material and the manufactured article, has been dull. Considering the great variety of admirable fabrics brought out by manufacturers, it seems a puzzle why this branch of trade does not enjoy a more steady demand. Producers complain of the excessive competition and lowness of prices in all descriptions of goods. In jute, an improved state of trade has existed in the raw material, as well as in yarns and fabrics, at slightly harder rates, and the prospects look brighter for the immediate future. Flax has been slower of sale, at weakening prices.

**Lace.**—This branch has had an average demand for most classes of goods, but generally at prices the reverse of remunerative. Recently, several stocks have been sold at tender, at favourable discounts, but part of the goods were unfashionable. The curtain trade has not changed much since our last report. A few specialties in edgings, frillings, and made-up goods, have sold freely, but ordinary productions have moved slowly. Silk laces have only sold meagrely, and the same may be said of Honiton braids and cotton purls. Cotton nets, window blinds, bobbin and such like goods, although in fair demand, have not sold in such quantities as to warrant the running of all the machinery, therefore there is much standing idle. Millinery laces, taken all round, have been in a depressed state.

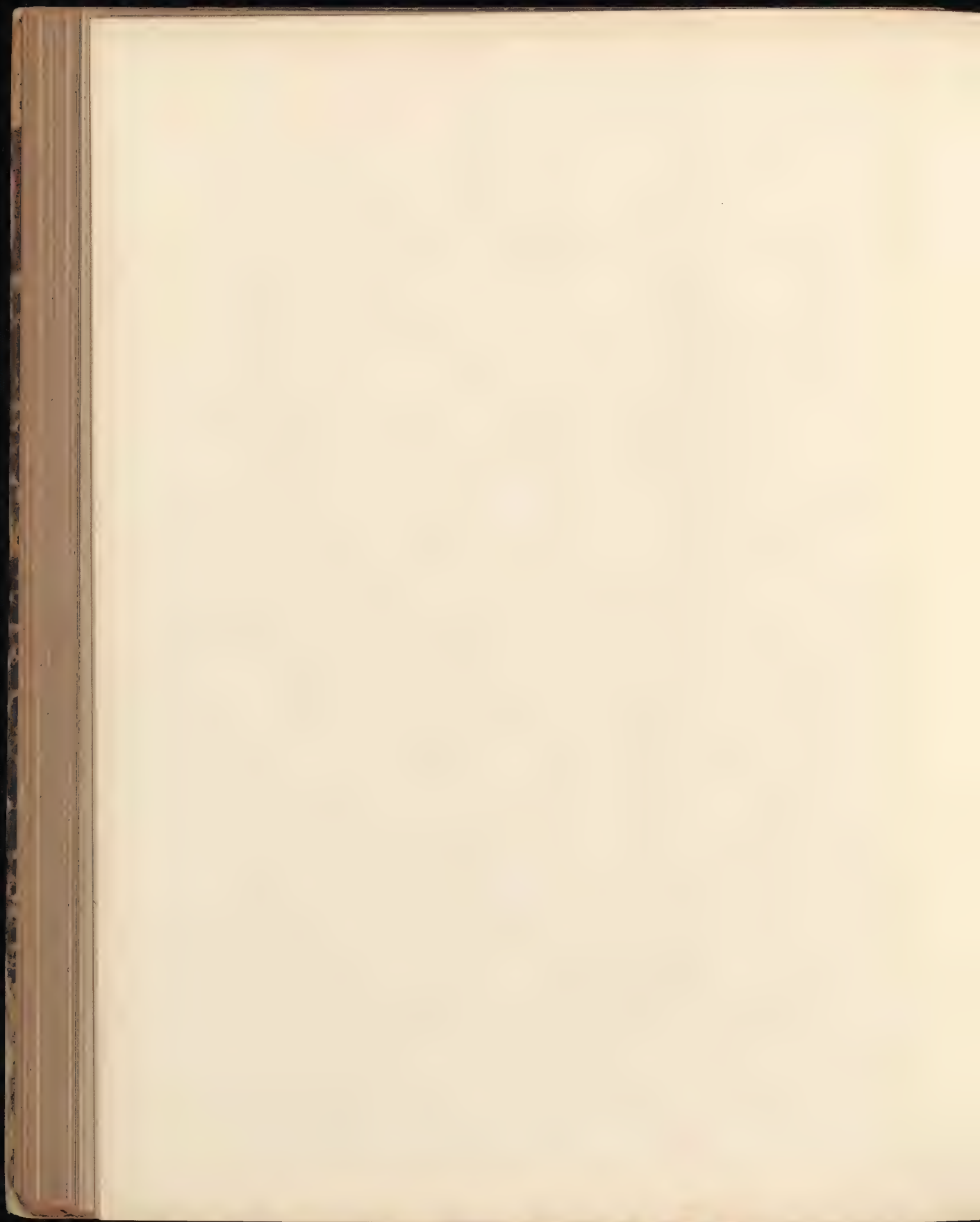
## Commercial Depression in France.

A correspondent at Bordeaux writes:—"France is passing through a period of commercial depression that is quite as severe as is experienced on your side of the Channel, and amongst our politicians the cry for 'Fairtrade' is often heard. It does not seem to be altogether logical that a nation that approves and profits by the bounty system in certain branches of her trade should claim protective legislation for others; yet the demand is made, notwithstanding its glaring inconsistency. The ribbon trade at St. Etienne, which until quite recently seemed to be safe from the ravages of commercial depression, now finds itself cruelly hit, and the factories of that town are issuing less than half their usual output. This state of things is, in part, brought about by the severe competition of other nations, and, in part, by the arbitrary dictates of prevailing fashions. Until plain colours came into vogue, the ribbons of St. Etienne had almost a monopoly in the markets of the world. This is now changed, as the manufacturers of Switzerland and Germany have commenced to introduce a large proportion of cotton amongst the costlier tissue, and the ribbons when made up appear almost as good as those of St. Etienne, the consequence being that France is undersold even in her own markets. The merchants of St. Etienne are at their wits' end, for the protective duty on cotton, entering this country, is sufficiently heavy to practically prohibit its use; indeed, ribbons partly composed of that commodity cost an enhanced price in production. 'If the industry is not to be entirely ruined,' say the manufacturers, 'the duty on cotton must be greatly reduced, if not abolished altogether.' The outlook for this important branch of trade is extremely serious, and the manufacturers find that it is as difficult a proceeding to change the law as to alter the fashions. Fair-traders may revel in their doctrines to their hearts' content, but statistics—hard, bare statistics—betray the hollowness of their cause. Some time ago, the United States put on a protective duty of 60 per cent, and the result is that the export of French ribbons to the States now amounts to 4,000,000f., instead of 30,000,000f., as it used to be a few years ago. Germany, Austria, and Russia have followed in the same line, the latter country fixing her duty at 100 per cent, with a result to St. Etienne that an export trade of 75,000,000f. a dozen years ago is now reduced to 25,000,000f."





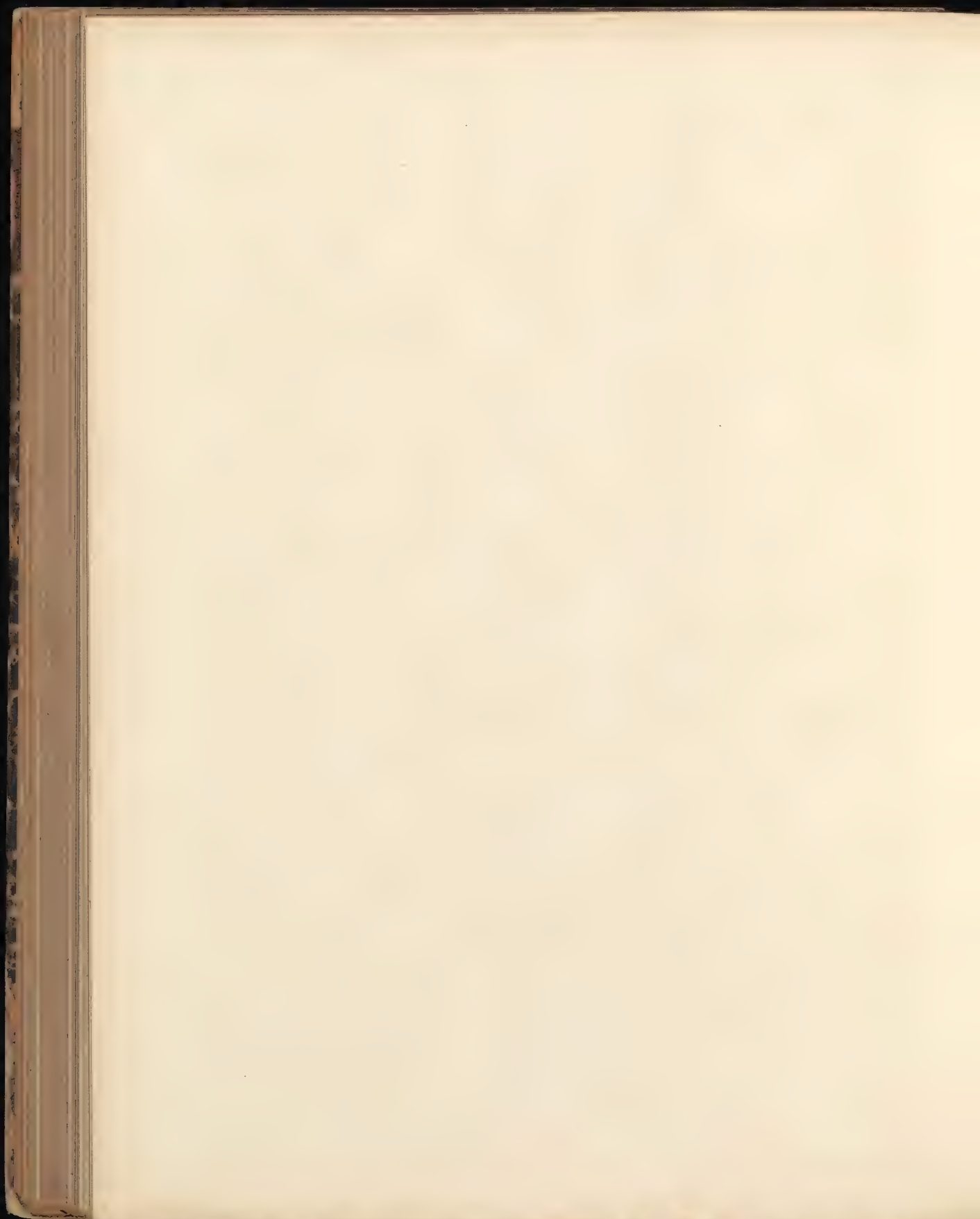
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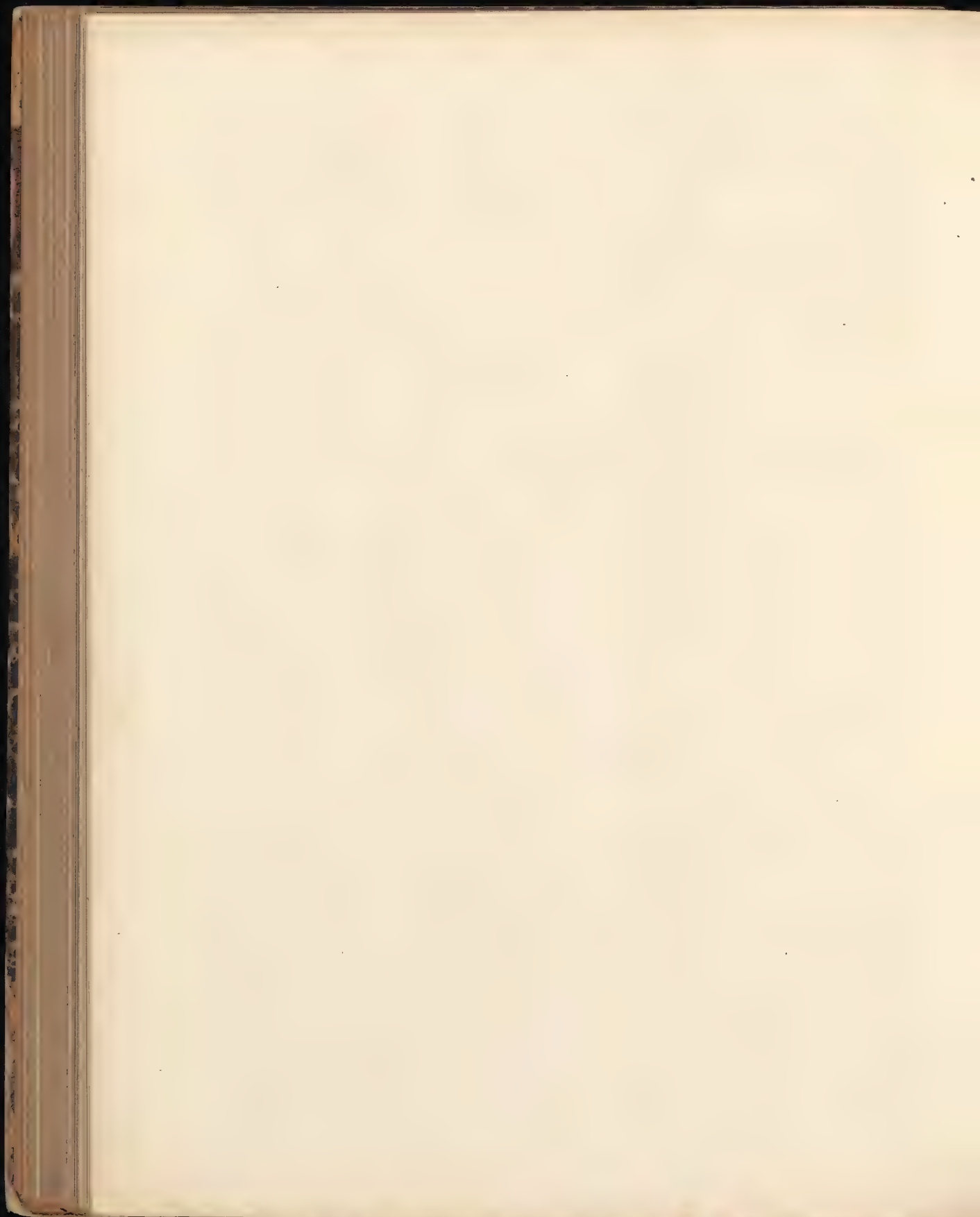
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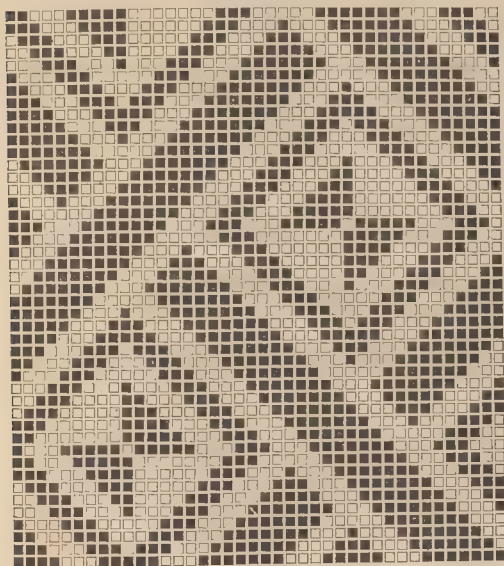


## ORIGINAL DESIGNS.

### Dress Goods.

The following design is for dress goods, and will make a useful pattern for a filling, with larger figures introduced. It is on 36 ends, and should be woven with about 60 picks per inch.

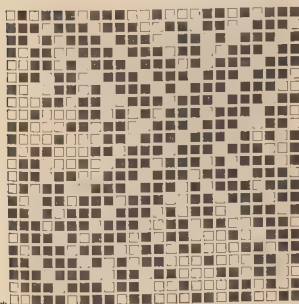
No. 378.



Design.

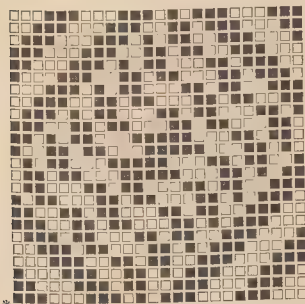
### Thin Worsted Coatings or Mantle Cloths.

No. 379.



Plan.

No. 380.



Plan.

Warp :—2/28's.

Weft :—2/36's.

3,900 ends.

56 picks per inch.

4 ends in a reed.

56 ends per inch in the loom.

70 inches wide in the loom.

56 inches wide when finished.

### Fancy Worsted Coatings.

No. 381.



Plan.

- 1 Brown, 36/2 worsted.
- 1 Black, 16 skeins woollen.
- 2 Dark Olive, 36/2 worsted.
- 1 Black, 16 skeins woollen.
- 2 Black, 36/2 worsted.
- 1 Black, 16 skeins woollen.
- 1 Black, 36/2 worsted.

Warp :—2/36's worsted.

Backing 16 skeins woollen.

Face weft :—36/2 worsted.

Backing 14 skeins woollen.

No. 382.

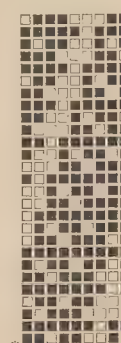


Plan.

- 3,200 face ends.
- 1,600 backing ends.
- 76 picks per inch.
- 6 ends in a reed.
- 68 inches wide in the loom.
- 84 ends per inch in the loom.
- 56 inches wide when finished.

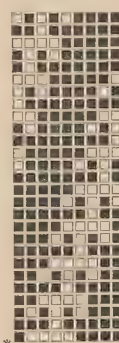
### Worsted Coatings.

No. 383.



Plan.

No. 384.



Plan.

Warp :—2/48's.

Face weft :—32's single.

Backing weft, 7 skeins.

3,200 ends.

78 picks per inch.

4 ends in a reed.

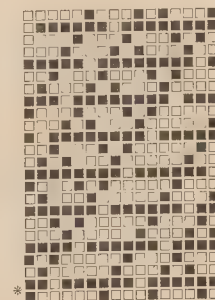
52 ends per inch.

68 inches wide in the loom.

54 inches wide when finished.

### Cotton Warp Matelasses.

No. 385.



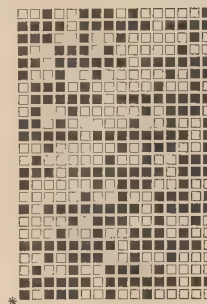
Plan.

Warp :—2/40's.

Face weft :—32's.

Backing weft, 7 skeins.

No. 386.



Plan.

3,040 ends.

78 picks per inch.

2 ends in a reed.

120 gear or 52 ends per inch.

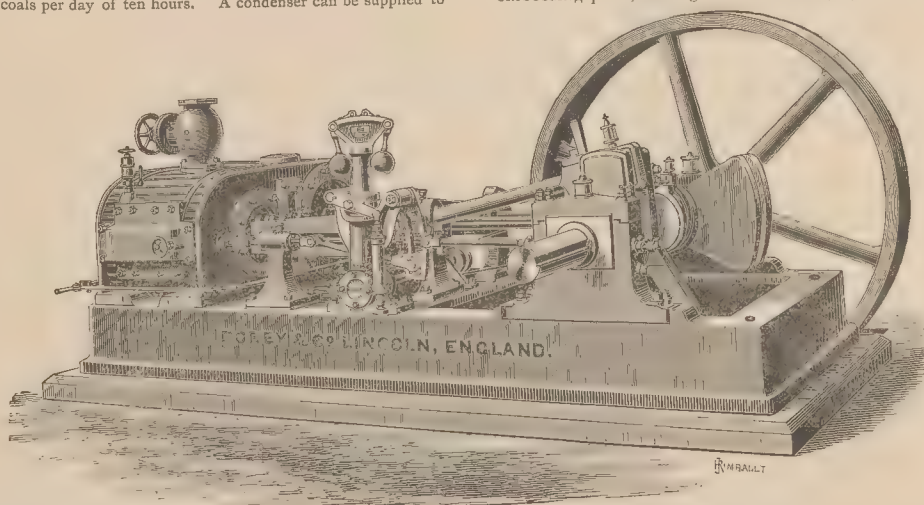
60 inches wide in the loom.

54 inches wide when finished.



### In Improved Compound Fixed Engine.

Our attention has been drawn to a new pattern of compound fixed engine, which has been specially designed for use when great power is required to be developed in a limited space, and under such circumstances it appears to be preferred to the long stroke horizontal engine. From the illustration we give below, it will be seen that the engine is erected on a massive cast iron foundation, which gives it great stability, and renders it almost independent of any other foundation. The crank bearings, and all other working parts are of great size, thus not only conducting to smooth and cool running, but materially reducing the wear and tear. The engine being carefully balanced, and steel and phosphor bronze being largely used in the construction of the parts subjected to the greatest strains, vibration and consequent wear are reduced to a minimum. The high pressure cylinder valves are arranged in such a manner that the point of cut off is automatically fixed at the best point, the gear being controlled by Richardson's patent expansion governor, which we illustrated in a recent number of this Journal. It is considered that, by the arrangements here indicated, the formation of the simplest and best expansion gear hitherto made is the result. Special attention having been paid to the matter of lubrication, the engine is thereby rendered the more suitable for long runs. Another result has been specially aimed at, and that is the economy in fuel. Carefully conducted tests show that less than 20 lbs. steam=2 lbs. of coal, are required to develop one-horse power, thus 50 H.P. can be obtained from less than half-a-ton of coals per day of ten hours. A condenser can be supplied to



the engine when there is a sufficient water supply, in which case the power is increased, and the consumption still further reduced. This engine is specially suitable for weaving or spinning factories, or for any similar works, when comparatively light speed is required to be maintained, accompanied by great regularity and economy. For electric lighting purposes also, the engine will be found unequalled. Messrs. Robey and Co., of Lincoln, are the makers.

### Patent Spindle Tape Connector.

A very simple and efficient contrivance for the joining together of the ends of the spindle and other tapes, has been patented by Messrs. Jackson and Williamson, of Glossop. The connectors, or fasteners, are made of steel, brass or such like metals, and are simple in the extreme, and in many districts, owing to their utility in fastening tapes cheaply and effectually, the latter are taking the place of double looped spinning bands. The advantages claimed for the invention are that it brings the ends of the tape together, and allows it to work *endless* without causing any jerking motion, and therefore unequal twist is prevented in yarns. It dispenses with sewing and overlapping, thereby effecting a saving in wear and tear. It can be applied instantly, and can be tightened or slackened as required, by any young person, without stopping a frame, and without fear of damage or injury, though spindles may be running at a great speed. These connectors, or fasteners, are made in sizes to suit various widths of tape, and can be supplied at a less price than it costs to sew the latter and will wear as long as the tape itself. A further advantage is that short lengths of tape can be utilised by the adoption of extra fasteners. The inventors recommend their connectors to flax, worsted, and other spinners and manufacturers, and guarantee its effectiveness, combined with economy.

### Embossing Fabrics.

In the embossing of designs upon textile fabrics, &c., it has been usual, hitherto, to apply heated plates, blocks, or matrices, the heat being transmitted to these externally, or by steam applied to tanks internally, under high pressure. An improvement has been patented for the above purpose, the principal feature being the use of mercury as a medium for transmitting the heat. A tank is used in which is formed a mercurial bath, and the object to be printed, or embossed, is placed upon the surface of the mercury (the desired design being first affixed upon the cloth), so that only the parts required to be affected by heat shall come in contact with the surface of the mercury; or the cloth is fixed to the bottom of the tank, and the hot mercury is made to flow upon it. When fine work is required, the mercury is heated and placed in a closed tank or cistern, to one side of which is fixed the embossing plate and figures, and, having formed a table which slides in or upon grooves, or traverses on runners, the figured side of the hot tank is made to descend upon the cloth as stretched upon the table by hydraulic or other pressure when required, and thus causes the whole of the figure work to appear either with a pressed or a floss surface, as may be required; or the same effect may be attained by an open mercurial tank, at the bottom of which is a base plate perfectly level, on which lays a bath of mercury surrounding the template or embossing plate, the figures of which project a little above the

surface of the mercury, so that the cloth to be impressed can only touch the surface of the figured design to be impressed upon the cloth, the latter being secured to the upper plate in which fine steel pins are fixed for the purpose of securing the cloth in position as adjuncts to the general bordering, which is nipped to the side of the descending tank, and attached to the press for the purpose of embedding the figure to the depth required on the inner surface of the descending cloth or other material, by hydraulic or other pressure. Samples of plush, velvets, &c., have been embossed for us by the new process; these can be inspected by those interested in the embossing of fabrics. We may add that the patentee is desirous of disposing of his invention, or he would not object to the formation of a company for its working. The terms upon which this would be arranged are in our hands, any further particulars can be had of the patentee. The process is adapted to the embossing of any description of fabrics.

The Prime Minister, the Hon. Duncan Gillies, acting on behalf of Victoria and in conjunction with the other Colonies, has forwarded through the Governor, Sir Henry Loch, a cordial invitation to the Prince of Wales to visit Australia next year on the occasion of the Adelaide Jubilee Exhibition. The Governor readily responded to the Premier's suggestion and forwarded the invitation to the Earl of Rosebery, assuring him that a visit from his Royal Highness would give the liveliest pleasure to the Australian Colonies.





### The Dyeing of Tusser Silks.

Extract from "The Handbook of the Collection Illustrative of the Wild Silks of India," by Thomas Wardle, Esq.



WE have great pleasure in giving to our readers a chapter on the "Dyeing of Tusser Silks," and we have no hesitation in saying that a careful perusal of it should lead our subscribers to invest in other works in connection with industries, by the same author—from which much valuable information, suitable for manufacturers of silk goods, may be obtained. A good deal is beginning to be said as to the rival merits and demerits of aniline dyes and those of older and more permanent natures. The advocates of each, probably, allow their prejudices or preference to guide their conclusion beyond what can be borne out by either history or practice. It is perfectly true that the older modes of dyeing generally gave more permanent results than the modern modes. That is an incontrovertible fact, and one need not stop to cite instances to prove it. Old specimens of woven fabrics, of silk may be seen in the South Kensington Museum, whose colours have stood, but little impaired, for more centuries than the results of modern dyes would stand months of exposure to light. It is also as true that the dyes from aniline, naphthylamine, and other kindred derivatives are fugitive, and it is exceedingly improbable that science will ever make them proof against that most searching and crucial of all tests—light. The natural hues of colour of the older modes of dyeing, and their combinations, are also of more refined, and, therefore, more artistic tones than the modern chemical dyes give; hence they are preferred by those whose tastes and insight are more artistic than those of the general public, which are more or less unrefined, and, therefore, more or less meretricious and gaudy. But a remarkable change has gradually come over the preference for colour throughout Europe within the last 20 years, or since the days when the magenta colour was adored. Less gaudy colours are now preferred in all decorative departments, and the truer principles of colour combinations are more understood and liked. There can be no doubt that this change has been brought about, in painting for instance, by modern pre-Raphael thought and work. So much has this influence been felt, consciously and unconsciously, that the colour products for the million, recently, and even now occasionally, so gaudy, have given way to more sober hues and combinations. As the whole of the colour in modern commerce in dyeing and printing is produced, practically so to speak, by aniline and analogous dyes, it has been found comparatively simple to imitate and produce the more sober hues by the admixture in varying proportions of these chemical dyes, not, it is true, so perfectly as to prevent detection by the skilled eye, or more effectually by laboratory tests, but sufficiently so as to subdue the garish effects I have mentioned. Hence, it may be argued, are aniline dyes to be totally condemned? Much as we justly condemn in the aniline dyes all that is so garish and so fugitive, we are led to the consideration of the controversy of to-day as to whether we may legitimately use aniline dyes, or, in fact, any fugitive dyes, and their combined coloured effects, or not. I do not wish to be an apologist for fugitive dyes, whether the source be aniline or not, but, in fairness, I ought not to omit to put on record in this argument that, in practice, there have always been the two kinds of dyeing, viz., permanent and fugitive, and that each has its use. No one can read an old French work on dyeing without constantly meeting with the phrases *bon teint* (fast dye) and *petit teint* (fugitive dye). They were always produced to order by any dyer, but for different purposes. In the east, too, where for thousands of years the best dyeing has been done, has the same practice prevailed, and the fugitive dyes have been used, but, it is true, to a more limited extent than the permanent ones. Having been engaged,

for some years in the examination of both the dyed fabrics and the dyestuffs of India, I can truly state that several of the dyestuffs of vegetable origin are extremely fugitive; yet they have long been, and are still, used there. There are many purposes for which the cheaper and more speedily applied fugitive dyes may be used, and will always be used so long as they are more economical in either saving money or time, as, for example, all fabrics which are not designed or intended to last long, or to wear long, or to be exposed to sunlight. I may mention two of the most useful dyes, without which dyers all over the world would find it difficult to match the patterns of their clients, neither of which are of aniline origin. I allude to turmeric, an Indian dye (the root of *Curcuma longa*), and the sulphate of indigo. The first I have been surprised to find to be the dye of the brilliant yellows of some of the garments of India and Kashgar, and it is even more fugitive than many of the aniline dyes to both light and chemical re-agents. Sulphate of indigo, whilst being fairly fast to light, disappears with washing, and should never be used for any fabric that has to be afterwards wetted or soaped. But whilst having written so much for the aniline side of the question, I must not be supposed to waver in my allegiance to *bon teint*, and I unhesitatingly say that modern dyeing and printing is in a very discreditable and unsatisfactory condition, and the fugitive dyes are mainly used for purposes where a more rigid conscientiousness on the part of the manufacturers would never permit their use. It is no fault of the dyer; he provides either *petit teint* or *bon teint*, at the desire of his customer, the fabricant, perhaps, not to order always, but certainly to price, and often very low price; and, inasmuch as *petit teint* is cheaper and more quickly applied, materials are dyed by modes which cannot be too emphatically condemned, nor is the manufacturer or merchant to be altogether blamed for this debased state of things. For by far the most purposes of life to which colour is found to be a necessity and a comfort, the quality of permanence is imperative, as well as that such colour should partake of that sobriety and refinement which distinguish art from meretricious imitation of it. Amongst these may be mentioned all kinds of furniture and upholstery decorations, carpets, printed fabrics, and so much of dress as the tyranny of a frequent changing fashion will allow. The best modes of imparting colour to the wild silks of India have for some time engaged my attention, at the request of the Government of India. With regard to the Eria and Mooga silks, the investigations are yet too incomplete for me to state more than I have done under their respective headings, pp. 53, 61. I will describe as briefly as I can some of the more salient points in my recent experiences and developments of dyeing Tusser silk. Finding, many years ago, that Tusser silk opposed a resistance, in no ordinary degree, to tinctoral matter, I took an interest in the subject with a view of overcoming this resistance. In its small affinity, ordinarily speaking, for colouring matter, it ranks with the vegetable fibres of cotton and flax; and whilst, in many processes, it would come out scarcely tinted, the mulberry-bred silk would be found to have seized the colour with avidity. It, however, takes the aniline dyes, under certain conditions, moderately well. At that time, and for some years previously, little Tusser silk had passed through the dye-houses. About 40 years ago, an attempt was made to introduce it in Macclesfield for sewing silk for black; but, on account of its irregular way of taking the dye, it was abandoned, with the result that little or no Tusser silk has been used for sewing purposes from that day to this. About 12 years ago, I made many experiments in dyeing this silk, and had the satisfaction of seeing my way to further improvement. In 1873, the firm of which I am senior partner, consisting of my brother and myself, exhibited, at the International Exhibition at South Kensington, the result of progress up to that time in a series of black and coloured silks, which were in advance of any similar effort, either English or continental, as far as my observations or knowledge extended, and they attracted a good deal of attention, and led to a further utilisation of Tusser silk, then a drug in the market, except for dress silks for women and girls in the undyed and pleasing shade natural to it, which is fawn colour. The development up to that time had been that this silk could be dyed into any middle or dark shade of drab, slate, brown, green, violet, or dark red, whilst to pale shades of blues, pinks, cerise, scarlet, and others, the dark, natural ground colour of the silk



interposed an insuperable barrier, as sulphur or any then known bleaching agent, could not reduce the silk to a whiter state. The desideratum of pale shades led our quick French neighbours to study the composition of the brown-colouring matter, and to find a solvent for it. The credit of this achievement must be awarded to the late M. Tessié du Motay, who was led to try permanganate of potash, which was at that time attracting much attention on account of its great oxidising power on organic matter. He found the brown colourant yielded to this agent. Unfortunately, the oxidising action being too violent, the fibre of the silk, as well as its colouration, was affected, and by the time it became white enough for dyeing into pale colours, the silk was rendered useless. However, a secret had been discovered; and it was this, that oxygen, under certain combining conditions, united with the colouring matter, which then became separated from the silk. The object now was to apply the oxygen under gentler conditions. This M. Tessié du Motay again succeeded in doing, and in a very ingenious way. He brought into contact with the silk an insoluble body; this, on contact, should yield up an atom of oxygen, in the nascent form, which should gently unite with the fawn-coloured matter of the silk without attacking the fibre. This, although a rough method, solved the difficulty, and the silk can now be bleached so as to have a sufficiently pale ground to admit of its being dyed into any pale colour except white. The substance he found to comply with the required condition is binoxide of barium. Unfortunately, the process is expensive. It costs almost 2s. per lb. to use and apply it. This, in addition to the cost of dyeing, prevents its being used as extensively as it would be if it were as cheap as the mode of bleaching ordinary silk, which is by sulphurous acid; but there is a probability of the principle being shortly applied by other methods which will be at the same time cheaper and more within the legitimate sphere of dye-house technical operation than that of M. Tessié du Motay; I mean, whereby the nascent oxygen shall be presented to the silk in the vat from a solution, instead of from a solid, as at present. Major Coussmaker has succeeded in obtaining perfectly white Tusser silk by alteration of the conditions under which the worm spins its cocoons. He causes the caterpillar to void all its cement before allowing it to spin its cocoon, but he does not give full particulars of his method. His experiment is very remarkable. He has sent me a cocoon which is free from all brownness, and resembles the Chinese or Japanese cocoons in shade. If this result is attainable, the difficult and costly bleaching process will be rendered unnecessary. It would be curious and useful to know if so desirable a result is practicable. For all darkish shades, I have found aniline dyes the most effective, and in some cases the only way at present of obtaining them; and until effective modes of dyeing Tusser silk into permanent dark shades are discovered, *petit teint* must be employed for them as also for the lighter shades for commercial uses. The artistic demand alone is not sufficient to stimulate a growing industry like this, nor to encourage the utilisation of a product which can be cultivated over nearly the whole of India; and it is better to use what lies ready to our hand, in the absence of better modes, and to accept what commerce will, with or without our artistic leave, be sure to take, on account of lowness of cost and rapidity of application. I mean that the absolute permanence of the dye for most of the purposes for which Tusser silk will be used is of less importance than the development and utilisation of so eminently useful a product of nature. There are plenty of permanent dyes at hand for Tusser silk for embroidery and artistic purposes, if artists will only be content to use those natural colours which the best dyes will yield to this silk, and not require combination and tones which are unsuitable both to those dyes and to this silk. Such colours are darkish shades of subdued blue, gold, yellow, low-toned purples, strong reds, greens, &c. Amongst the numerous dyestuffs indigenous to India, of which I have received samples for examination, by order of Her Majesty's Government of India, I may mention the following as being the best adapted for dyeing Tusser silk; and others will, no doubt, appear as my examination proceeds:—*Lac. Safflower. Leaves of Phyllanthus emblica. Calyces of Thespesia populnea. Flowers of Butea frondosa. Indigo. Hursingar flowers* (especially good). *Flowers of Cedrela toona* (very good). In addition to the above, I may mention the following as being useful dyes, though not yielding such rich

colours as those previously mentioned:—*Munjeet* (root of *Rubia munjistia*). *Cotton flowers. Sapan wood. Flowers of Grislea tomentosa. Root of Morinda citrifolia. Ashna bark. Root bark of Ventilago maderaspatana.* The following also, although the colours produced by them are poor in comparison to the preceding, will be found to yield useful results with Tusser silk:—*Seeds of Cassia tora. Pista phul. Bark of Euphorbia tirucalli. Pomegranate rind.* That Tusser silk should be more difficult to dye than mulberry silk may well be inferred from the difference in degree of solubility of the two silks. A neutral solution of chloride of zinc, gently heated, dissolves mulberry silk instantly, whilst it only dissolves Tusser silk slowly. In a cold solution, I found it took three days to dissolve mulberry silk, but with Tusser silk, a fortnight's immersion produced no effect. Similar effects are also produced by an ammoniacal solution of copper oxide, which has the property of effecting the solution of both silks in the cold more quickly. The cold solution rapidly dissolves mulberry silk and also cotton. It dissolves Tusser silk more slowly, but its effect on wool is simply to blacken it without dissolving it. As the preparation of this solution requires care, it may be well if I explain the method:—1. Make a strong aqueous solution of sulphate of copper. 2. When cold, add to this solution a few drops of strong ammonia until the whitish-blue colour formed begins to change to a deeper blue. 3. This whitish-blue colour is due to formation of a precipitate, which wash several times with water on a filter. 4. Dissolve the precipitate in cold concentrated ammonia.

### The Board of Trade Returns.

The Board of Trade returns published for June and the six months are more satisfactory than many recent issues. From an examination of the statistics, it would appear that the condition of trade has distinctly improved, and we may probably witness a yet more decided movement when the election disturbances have died out. The exports of British and Irish produce and manufactures show an increase for the month of £818,787, reducing the decrease for the six months to £1,036,326. In the imports there is a falling off of £135,043 for June, owing principally to the lower value of cereal produce, and a loss on the six months of £19,086,758. Dealing with imports the totals are;—

	June.	Six Months.
1884 .....	£29,053,651	£198,981,141
1885 .....	29,236,984	189,927,401
1886 .....	29,101,941	170,840,643

Dealing with the month, articles of food and drink dutiable show an increase of £324,111, tobacco of £64,809, chemicals, dyestuffs, and tanning substances, £9,760; raw materials for textile manufactures, £1,946,525; and manufactured articles, £117,685. Animals living (for food) show a decrease of £217,609; articles of food and drink, duty free, £1,767,459; metals, £46,124; oils, £112,361; raw materials for sundry industries and manufactures, £306,346; and miscellaneous articles a decrease of £148,034. The aggregate exports have been:—

	June.	Six Months.
1884 .....	£18,049,174	£115,621,173
1885 .....	17,717,289	104,398,088
1886 .....	18,536,076	103,361,762

In the month animals (living) show an increase of £16,435, articles of food and drink of £23,489, yarns and textile fabrics of £689,407, metals and articles manufactured therefrom (except machinery) £240,244, machinery and millwork £24,739. On the other hand, raw materials exhibit a decrease of £156,059; apparel and articles of personal use, £5,795; chemicals and chemical and medicinal preparations, £8,959; all other articles, either manufactured or partly manufactured, a decrease of £4,704. The receipts of foreign and colonial produce were;—

	June.	Six Months.
1884 .....	£6,628,203	£33,818,510
1885 .....	4,810,543	29,075,823
1886 .....	4,246,590	27,066,711

The imports of gold during June were £1,692,114, against £890,749 last year; and for the six months £7,618,099, against £6,355,295. The exports for June were £1,273,209, against £439,509; and for the six months, £6,955,916, against £2,473,210. The import of silver for the month was £624,990, against £885,459; and for the six months £3,892,785, against £4,856,898. The export for June was £716,801, against £738,216; and for the six months, £3,875,550, against £5,344,161. The following is a tabulated summary for the six months ending June 30th, compared with the corresponding period of last year:—



## IMPORTS FROM FOREIGN COUNTRIES AND BRITISH POSSESSIONS.

	1885. £	1886. £	Inc. or dec. £
Animals Living (for food) ...	4,302,814	3,288,890	1,013,924†
Articles of Food and Drink— Duty free ...	63,339,440	52,066,628	11,252,812†
Articles of Food and Drink— Dutiable ...	9,150,487	9,957,383	806,896§
Tobacco—Dutiable ...	1,358,619	1,396,193	37,574§
Metals ...	8,303,591	7,674,864	628,727†
Chemicals, Dyestuffs, and Tanning Substances... ..	5,354,203	4,895,064	459,139†
Oils... ..	3,172,539	2,775,796	396,743†
Raw Material for Textile Manu- factures ... ..	44,057,422	40,145,352	3,912,070†
including			
Cotton, Raw ... ..	21,757,905	19,213,284	—
Flax, Hemp, and Jute ...	5,743,561	4,351,885	—
Silk, Raw ... ..	499,302	749,281	—
Wool, Sheep and Lambs' ...	14,761,441	14,493,795	—
Raw Materials for Sundry Indus- tries and Manufactures ...	16,494,179	15,107,078	1,387,101†
Manufactured Articles... ..	26,978,048	27,241,976	263,928§
Miscellaneous Articles... ..	7,416,059	6,271,419	1,144,640†

## EXPORTS OF BRITISH AND IRISH PRODUCE AND MANUFACTURES.

	1885. £	1886. £	Inc. or dec. £
Animals, Living ... ..	215,499	209,532	5,967†
Articles of Food and Drink... ..	4,012,661	4,062,959	50,298§
Raw Materials ... ..	6,408,970	5,716,937	692,033†
Articles Manufactured and Partly Manufactured, viz.:—			
Yarns and Textile Fabrics ...	50,251,761	51,556,882	1,305,121§
including			
Cotton Yarn and Twist ...	5,939,675	5,871,142	—
Cotton Manufactures ...	27,600,930	28,332,778	—
Jute Manufactures ... ..	971,121	864,729	—
Linen Manufactures... ..	2,435,663	2,614,601	—
Silk Manufactures ... ..	948,523	1,053,156	—
Woolen and Worsted Yarn	2,014,876	1,979,909	—
Woolen and Worsted Manu- factures ... ..	8,913,448	9,284,972	—
Metals and Metal Articles (except Machinery) .....	15,648,503	15,881,492	232,989§
Machinery and Millwork ...	5,690,197	4,762,523	927,674†
Apparel and Articles of Per- sonal Use .....	4,987,751	4,734,077	253,574†
Chemicals, and Chemical and Medicinal Preparations ...	3,410,440	3,366,265	42,175†
All other Metal Articles Manu- factured or partly so ... ..	13,772,406	13,069,095	703,311†
Total Value of Exports of Foreign and Colonial Produce (partly estimated) ... ..	29,075,823	27,066,711	2,009,112†
§ Increase.			† Decrease.

## Foreign Telegrams. New Regulations.

The new regulations respecting foreign telegrams agreed upon at the International Telegraph Conference held at Berlin have come into force. The principal alterations are the following:—(a) The rules relating to European have been assimilated to those relating to extra-European code telegrams, the limit of length of a word in such messages being fixed at ten letters, and words drawn from more than one of the authorized languages, viz., English, French, German, Italian, Dutch, Portuguese, Spanish, and Latin, being allowed; (b) the names of both the office and the country of destination will be counted in the address as one word each, whatever their length, provided they are written as single words by the sender, and are spelt in accordance with the official list; (c) the sender of a telegram will be able to have it repeated from office to office, during transmission, by paying an additional quarter-rate instead of a half-rate as at present; (d) if the sender of a European telegram prepay a reply, and the reply form is not used by the addressee, the amount prepaid for a reply will not be refunded, as hitherto; (e) if the addressee of a telegram have it repeated, and it then prove that only a portion of the telegram was inaccurately transmitted, only a proportionate part of the charge will be refunded; (f) the charge for any word or words omitted during the transmission of an extra-European telegram will be refunded; (g) the

rates to several countries will be reduced, as may be seen on reference to the "Post-office Guide" for July. The following are a few examples:—Russia, from 9d. to 6½d.; Spain, from 6d. to 4½d.; Italy, from 5d. to 4½d.; India, from 4s. 7d. to 4s.

## United States Consuls' Reports.

Towards the close of last year, the Government of the United States requested its Consuls abroad to investigate and report upon the subject of shipping bounties. These reports have now been collected and issued, and they contain a great mass of material more or less interesting. The gist of the matter, however, is contained in an introductory essay by Mr. W. C. Ford, the chief of the Statistical Bureau of the Department of State at Washington. In this essay, the history of shipping bounties in France is succinctly given, and their effects are indicated. Until the present year, France was the most extreme follower of the bounty system of any European nation, and even now, Germany, which in matters of domestic policy sometimes humbly copies from her neighbour, is not so thorough-going. France encourages the shipbuilders by premiums upon native-built ships, and stimulates the ship-owner to struggle for a greater share in the carrying trade of the world by large bounties on long voyages. And what has been the result? Mr. Ford sums it up as follows:—"The bounties have succeeded in infusing life into neither ship-building nor ship navigation. France finds it cheaper to have her iron vessels built in Great Britain, and a large share of her wooden ships in other countries. The lines of ships that were called into being through the liberal offers of the Government are represented as being in a state of bankruptcy, and existing lines that participate are either paying no dividends or very small amounts." Bounties, in fact, have made the economic situation worse in France than it otherwise might have been. This is valuable testimony from a quarter not likely to be suspected of undue partiality for Free-trade principles.

## Trade in the United States.

In woollens, a more decided tone was given to the New York market by the various influences which have been exerted in the direction of higher values. The strong tendency toward raising prices to meet the increased cost of the raw product seemed likely to receive added force from the reported result of the London sales, which indicated that the prices obtained were considerably higher. This foreign influence has been regarded as a moving feature by the New York trade, and while the total movement as yet in the way of orders and sales is not very large, it seems quite probable that the trade will concur in the movement. The more notable effect of this strong influence is seen in the market for dress goods and clothing woollens, as general woollens are as yet moving rather sluggishly. The Boston market is beginning to show a general but decided improvement in tone. So far as accounts have been received from the mills for the six months past, the results have been more satisfactory than during the preceding year. Production, though not crowded, is substantially full, and fair returns appear to be realised. Woollens are quiet, except that large deliveries are in progress. The next opening of samples will probably be on a higher level of values. The jobbers are carrying small stocks, and have relatively light trade to report for the present, save that strictly seasonable goods are in fair demand. The spring trade has proved satisfactory in most respects. The distribution of clothing is substantially over for the season, and the record of sales is ahead of last year.

At a recent meeting of the Glasgow and West of Scotland section of the Society of Chemical Industry, Mr. E. C. C. Stanford, F.C.S., exhibited a substance to which he has given the name of algin, or algenic acid, obtained from sea weeds. Algin can be obtained perfectly white, and dries up into a horny substance not unlike vegetable ivory, but heavier. It can be turned and polished in the same manner, or is easily prepared in thin transparent sheets, which possess considerable tenacity, differing from gelatine in being unaffected by hot water. With sodium it forms a compound which promises to be very useful as a dressing or finishing material of an elastic flexible character, capable of being converted into a lustrous hard glaze. Fabrics so treated become quite waterproof, and a new neutral waterproofing material, devoid of odour, is a gain to the arts.



### Receiving Orders.

Swanwick, P., 4r, High Pavement, Nottingham, lace manufacturer.  
Winder, A., Britannia Mills, Whitehall Road, Leeds, Yorkshire, cloth manufacturer.

### Adjudications of Bankruptcy.

Davies, D. (trading as Jeffreys, Davies and Co.), 22, Price Street, Liverpool, woollen warehouseman.  
Wylde, J. L., and H. Blaxland (trading as Wylde and Blaxland), 33, St. Paul's Street, Leeds, Yorkshire, woollen manufacturers.

### Dividends.

Avison, C., and F. Avison (trading as Avison Brothers), Batley, Yorkshire, woollen manufacturers and cloth finishers, 1sd. (final), 7, Field Hill, Batley.  
Goold, J. C., 12, Union Passage, Birmingham, silk merchant, 3s. 5d. on new proofs, being portion of first dividend of 7s. 2d., Official Receiver's Offices, Birmingham.

### Dissolutions of Partnership.

Bettson, G., and W. J. Bryan, 20, Broad Street, London, woollen warehousemen.  
Fison, W., F. W. Fison, and E. P. Arnold-Forster, Greenholme Mills Burley-in-Wharfedale, Yorkshire, worsted spinners and stuff manufacturers.  
Grass, A., and F. Thies, 45, Finsbury Pavement, London, manufacturers' agents.  
Mellers, T., and J. Liberty, 2, Holland Street, Goose Gate, Nottingham, lace manufacturers.

## PATENTS.

### Applications for Letters Patent.

Automatic sprinklers or fire extinguishers. J. H. Lynde, Manchester.	31st May	7,226
Automatic sprinklers or fire extinguishers. J. H. Lynde, Manchester.	31st May	7,227
Automatic "cutting-off motion" for steam engines. R. Dennis, G. Tricklebank, F. Johnson and F. Mellor, Sheffield.	2nd June	7,385
Automatic sprinklers for extinguishing fires. J. Fletcher, Ashton-under-Lyne.	17th June	8,047
Carding engines. J. A. Hart, London.	3rd June	7,470
Calendering or finishing woven fabrics. W. Robertson and J. G. Orchar, Glasgow.	7th June	7,608
Cleansing wool and woollen fabrics. L. A. Groth, London.	7th June	7,634
Connecting a pulley or wheel or shaft to a shaft, so that combined or independent motion may be obtained. E. Shaw, Bristol.	15th June	7,944
Carpets. Sallandrouze and Sallandrouze, London.	21st June	8,185
Construction of warp beams for weaving. T. Burns and F. T. Schmidt, Bradford.	23rd June	8,277
Combing or heckling flax or other fibrous materials. G. Stelling, London.	23rd June	8,315
Dyeing textile fibres. T. Holliday, London.	11th June	7,841
Driving spindles in machinery for spinning or twisting fibres. W. S. Cowgill, Bury.	1st June	7,312
Driving the spindles of preparing and spinning machinery. H. Stevenson, J. Webb, and S. Hallam, Manchester.	23rd June	8,272
Driving the tubes in roving, spinning and twisting frames. J. H. Craven and J. Crabtree, Bradford.	25rd June	8,275
Flax scutching machinery. J. Spence and W. H. Lawlor, London.	1st June	7,308
Feed boxes of combing machines. J. H. Whitehead, London.	2nd June	7,398
Feeding machines for wool, &c., to carding machines. A. Haigh, Halifax.	3rd June	7,447
Feeding or carrying wool, &c., in carding and other machinery. I. Holden, London.	2nd June	7,388
Facilitating the separation of threads or slivers of fibrous materials, applicable to carding engines. J. Hitchon and J. and J. Shepherd, Rochdale.	4th June	7,505
Fire extinguishing apparatus. J. Morton, Glasgow.	5th June	7,568
Frame for economising space in packing pile fabrics to prevent creasing. B. Shaw, Halifax.	21st June	8,172

Hand cutters for trimming lace, &c. S. Oudet, London.	18th June	8,121
Improvements in and in the production of reeds used in looms. G. and E. Ashworth, Manchester.	10th June	7,791
Improvements in connection with pulleys. F. L. Croft, Bradford.	18th June	8,099
Looms for carpets and fabrics. G. Crompton and H. Wyman, Paris.	1st June	7,313
Looms for carpets and fabrics. G. Crompton and H. Wyman, Paris.	1st June	7,314
Looms. R. Mercer, Blackburn.	8th June	7,668
Loom pickers. W. Holt and S. Fawcett, Manchester.	8th June	7,660
Loom shuttles. H. H. Lake, London.	15th June	7,995
Loom shuttles. H. H. Lake, London.	15th June	7,999
Looms. D. Fulton, Manchester.	18th June	8,095
Let-off motion for looms. J. Longton, Brinscall.	28th June	8,455
Manufacture and ornamentation of woven fabrics. J. Platt, Manchester.	8th June	7,655
Method of and apparatus for polishing warp threads. J. Burn, Bradford.	15th June	7,937
Measuring, rolling, and rigging woollen or other woven, felted, or knitted fabrics. W. H. Bortoft, London.	18th June	8,117
Oil economisers. H. Toulson, Bradford.	1st June	7,316
Operating the marking appliances of machines for sizing yarns. L. Wilkinson and E. Morris, Halifax.	2nd June	7,415
Oil and grease cups and oil syphons. E. Ludlow, London.	5th June	7,590
Power looms. J. Knowles, Blackburn.	31st May	7,216
Preparing flax, &c. J. C. Mewburn, London.	4th June	7,517
Pulleys, drums and wheels. A. Trask, Brockley.	4th June	7,534
Pickers for looms. J. and P. Yates, Halifax.	7th June	7,600
Production of projecting, open or fancy edging (not fringe) to handkerchiefs by weaving, each handkerchief having a selvage all round. W. C. Pownall, London.	12th June	7,926
Pickers for looms. J. Dawson and H. Armistead, Halifax.	23rd June	8,268
Pickers for loom. C. Vickers, Leeds.	28th June	8,465
Rollers for ring doubling frames. T. Ivers and S. Rogers, London.	1st June	7,309
Rollers for wool or yarn scouring machines, &c. H. Allison, Bradford.	1st June	7,348
Regulating motion of lap machines for opening cotton, &c. W. Taylor, Manchester.	5th June	7,557
Rotary wool combing machines. T. Speight, Bradford.	26th June	8,416
Spinning, doubling and twisting machinery. J. W. Midgley, Skipton-in-Craven.	31st May	7,219
Straining driving belts or bands on their pulleys. D. S. Beesley, London.	1st June	7,364
Shuttle tongues. T. Morton, Hyde.	3rd June	7,434
Steam engines. D. L. Cross, London.	4th June	7,509
Self-acting temples for looms. W. Chetham, Salford.	5th June	7,550
Scutching flax, &c. W. Henderson, Benton.	23rd June	8,264
Silk, satin or fabric embossed, designed, wall decoration. L. Dantz, Liverpool.	26th June	8,417
Tappits for looms. M. Leach, J. Heaton, and J. Bentley, Bradford.	31st May	7,236
Treatment of vegetable textile materials and of threads and fabrics made therefrom. F. Mollet-Fontaine, London.	31st May	7,278
Taking-up motion for steam power looms. T. H. Briggs, Bradford.	7th June	7,602
Treating silk and silky rags for manufacturing purposes. W. M. and J. Archer, Sandal.	9th June	7,735
Treating and finishing woven fabrics. T. Hardcastle, Manchester.	15th June	7,943
Treatment of rehea or China grass and machinery therefor. R. Mansfield and A. Goddard, Nottingham.	28th June	8,449
Twist lace fabrics. A. and F. H. Lees, London.	28th June	8,476
Velvets. H. Lee, Manchester.	3rd June	7,432
Winding yarns. B. A. Dobson, Manchester.	31st May	7,244
Weighing and supplying wool, &c., to carding and other machines. I. Holden, London.	2nd June	7,388
Woven fabrics. Park, Lomax and Wall, Leyland.	10th June	7,773
Washing or scouring wool in skins or tissues. A. J. Boulton, London.	16th June	8,043
Washing, dyeing, drying, &c., fibres or fibrous materials. F. Weintraud, London.	22nd June	8,250
Wool washing machines. E. and A. Peltzer, Manchester.	25th June	8,364
Winding-up apparatus for lace and embroidery machines. R. Mansfield and A. Goddard, Nottingham.	28th June	8,449
Yarn beaming machines. A. Hitchon, Halifax.	2nd June	7,372

### Patents Sealed.

6,018	6,418	2,616	6,541	6,680	6,828	7,857
2,623	2,784	2,808	6,840	6,897	6,902	7,187
8,109	6,233	6,668	7,138	7,283	7,284	7,931
2,972	7,433	7,631	10,705	3,060	3,169	4,550
5,835	6,927	7,068	7,138	7,305	7,967	9,229
7,404	7,519	7,662	8,708	7,783	7,889	10,357
7,709	8,009	8,545	13,080	5,936	8,069	8,210
3,898						3,819



# The Journal of Fabrics AND Textile Industries.

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## Notices.

The Yearly Subscription—payable in advance—including home postage, is 10s. Cheques and Post Office Orders to be made payable to H. & R. T. LOAN, 10, Ann Place, Little Horton Lane, Bradford, Yorkshire.

The Publishers will be happy to receive intimations of New Inventions, Patents, &c. The Publishers are open to receive, from Designers, Original Designs of Carpets, Damasks, Tapestries, Linen, Cretonnes, &c., and such as are accepted will be published with the Designer's name affixed. All Designs sent for approval must be 10 inches long by 7 inches wide for single page, and for double page, 16 inches by 10 inches, and must be accompanied by Postage Stamps sufficient to pay return Postage in case they are rejected.

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To prevent any misunderstanding, all Articles sent to the *Journal of Fabrics and Textile Industries* for publication, will be considered as offered gratuitously, unless it is stated explicitly that remuneration is expected.

Readers are invited to forward items of interest to the Trades concerned. The Proprietors will feel greatly obliged if any of their readers, in making enquiries of, or opening accounts with, Advertisers in this paper, will kindly mention the *Journal of Fabrics and Textile Industries* as the source from whence they obtained their information.

We beg to remind our readers that the amount of our Subscription is small, and the sum a very trifling one for each recipient to pay, but when great numbers of accounts are in arrears for one or two years, the aggregate amount becomes a large sum to us; we therefore respectfully, but earnestly, ask our Subscribers for prompt payment, and also to inform us in writing when they wish to discontinue taking the Journal, as it is impossible for us to know without receiving such information.

## The Liverpool Exhibition.

THE Exhibition, which is now being held in Liverpool, gives every promise of being a decided success, not fewer than a million-and-a-half persons having already paid a visit to it. The executive have gone to work the right way in order to make the Exhibition attractive as far as amusements are concerned. This we consider is a step in the right direction, because variety, which calls into exercise the various organs with which humanity is endowed, prevents the possibility of weariness arising from monotony to visitors who attend such places mainly for the purpose of satisfying a desire for a day's outing, and who have no close interest in inventions, machinery, or objects of science or art, which are usually included in the catalogue of articles which go to make up a good exhibition. But, apart from considerations on the score of amusements, as we must pass our opinions irrespective of such, we can confidently recommend our friends to pay the "Shippieries" at least one visit. There is much that will interest those engaged in all branches of trade, but we cannot here do more than briefly indicate those exhibits which are of most interest to our class of readers—those engaged in the textile trades. First in order, we will take the collection of textile fabrics, &c.—Messrs. Pim Brothers and Co., Dublin, have a good dis-

play of Irish silk popline, silk handkerchiefs, and damask and broadened terries for curtains and furniture coverings. Messrs. Henry Fawcett and Co., Kidderminster—Childema carpets, with border woven with the body carpet. Messrs. Hirst Bros., Elland, Yorkshire—Woollens, pelions, or bayetas. Mrs. Ernest Hart has a stand devoted to Irish industries. Messrs. Baldwin and Walker, King Cross, Halifax—Stocking yarns, and fancy knitting wools. Wolfhill Spinning Co., Limited, Ligoniel, Belfast—Flax in various stages of manufacture. Messrs. Richardsons and Niven, Lambeg, Lisburn, Ireland—Linen and cambric handkerchiefs, canvas, ducks, diapers, towels, toilet covers and hollandas. Messrs. Tyler and Co., Maeslyn, South Wales—Hunting serges and cloths, woollen shirtings, Welsh flannels, tweeds and meltons, stockings, and stocking yarns. Messrs. Jubb and Co., Shambles Street, Barnsley—Patent carriage and travelling rugs, lined with Arctic down, art bedcovers (ventilated.) Messrs. Horrocks, Miller and Co., Yard works, Preston—Long cloths, mediums, twills, wigans, and sheetings. Messrs. Martin Mahoney and Bros., Cork, Ireland—Tweeds, serges, worsted coatings, fingered worsteds and yarns. Messrs. W. Bashall and Co., Preston—Bleached longcloth, mediums, twills, sheetings, and ladies' underclothing. Messrs. Swainson, Burley and Co., Preston—Long cloths, shirtings, plain and fancy muslins, frills, brocades, net laces, &c. Messrs. Hicks, Steen and Co., Belfast—Cotton, cotton wool, cotton yarns, and cotton threads. Messrs. Booth and Co., Glossop, Derbyshire—Woollen and silk yarns for knitting and other purposes. The Bradford Manufacturing Company, Bradford, Yorkshire—English cashmere dyed in art shades. In weaving machinery there is not a great amount shown. Mr. George Hodgson, Bradford, Yorkshire, shows power looms for weaving plain and fancy cloths. Mr. E. Wilson, 17, James Street, Macclesfield—Cross border jacquard for working two sets of cards without changing them. Messrs. Monk Bros., Peel Hall Foundry, Preston—Patent over pick loom, picking shafts, &c. There is a variety of appliances for steam boilers, such as mechanical stokers, fire bars, &c. Mr. Thomas Henderson, C.E., Castle Street, Liverpool shows patent self-cleaning furnaces, patent mechanical stoker, patent air-circulating furnace, front, and fire-door, and the universal sight feed automatic steam lubricator. We shall have more to say of this exhibit. Mr. James Proctor, Hamerton Street Iron Works, Burnley—Patent mechanical stoker, with moveable fire bars. Messrs. Hodgkinson and Co., Salford, Manchester—Mechanical stoker and self-cleaning fire bars. The Leeds Forge Company, Limited, Leeds—Fox's patent corrugated furnaces and flues for steam boilers. Mr. C. Whitfield, Kettering, Northamptonshire—Patent furnace bars. Messrs. Murfet, Dobson and Co., Fletcher Gate, Nottingham—Patent furnace bars. We will now proceed with general exhibits of interest. The Blackman Air Propeller Company, Limited, 57, Fore Street, London, show a patent Blackman propeller. We have before had occasion to draw attention to this appliance for ventilating purposes. The Globe Electric and Engineering Company, 20, Dartmouth Street, Westminster, London—Electric lighting appliances, patent speed indicator and "Globe" dynamo. Messrs. John Mills and Sons, Newcastle-on-Tyne—Mechanical telephones for speaking short distances. The India Rubber, Gutta Percha, and Telegraph Works Company, Limited, Cannon Street, London—India rubber, gutta percha, and ebonite manufactures, and electric light apparatus, the "Silvertown" Dynamo-Telegraph Material. Messrs. T. R. Harding and Son, Leeds, show improved engine and machine counters, and a variety of indicators. Messrs. B. Whitaker and Sons, Horsforth, near Leeds—Patent automatic and manual water gauge for steam boilers. Messrs. J. Wilkes and Son, Birmingham—Solid drawn cop tubes, &c. Mr. T. Dixon, Buttershaw, near Bradford—Dixon's slide rules. Messrs. A. Haacke and Co., Regent Road, Liverpool—Compositions, patent non-conducting packing, lubricants, &c. F. Leroy and Co., Manchester—Non-conducting composition. Mr. Elijah Hunter, St. James' Street, Leeds—Specimens of incrustation removed from the inside of steam boilers by Hunter's Anti-Corrosive Composition. This is noticed on another page. Mr. Robert Hilson, Newcastle-on-Tyne—Non-conducting composition. Greenbank Alkali Works Co., Limited, St. Helens, Lancashire—A variety of chemicals used by manufacturers. Messrs. J. and E. Wood, Bolton—Wrought-iron pulleys. Messrs. Crossley Bros., Manchester—"Otto" gas engines. Messrs. J. J. Mackie and Co., Reading—Patent spring pulleys, &c. Messrs. W. and J. Galloway and Sons, Manchester—Compound engine and driving machinery, and other objects of interest. Mr. J. H. Kidd, Wrexham—Automatic steam pumps, &c. Messrs. F. Pearn and Co., Manchester—Steam pumps. Messrs. Robey and Co., Lincoln—Horizontal high speed engine, fitted with patent electric governor, driving a dynamo combined on same bed plate, and made by Mr. G. H. Greenhill, of King Street, Belfast; 25 H.P. horizontal fixed engine, fitted with Pröell automatic expansion gear; 12 H.P. "Robey" compound semi-fixed engine; 4 H.P. "Robey" capstan engine; 4 H.P. vertical hoisting engine; vertical high speed engine and dynamo. This firm have also an engine on view which is used for returning the sledges in the Canadian Tobogganning. Messrs. Griffiths and Finning, Toxteth Park, Liverpool—Patent warehouse and passenger lift. Messrs. Boulton, Bros. and Co., Dale Street Liverpool—Valvoline Lubricating oils, and cups for using the same. Mr. N. C. Firth, Chester—Patent clock for checking workmen's time. Messrs. W. J. Richardson and Co., 11, Poultry, London—Columbia type writers. Messrs. John Bell and Son, 118, Southwark Street, London,—Asbestos for a variety of purposes. North British Rubber Co., Limited, Castle Mills, Edinburgh—India



rubber goods, such as hose piping, valves, packing, &c. Messrs. Mosses and Mitchell, Chiswell Street, London—Vulcanised fibre. Messrs. J. Tullis and Son, Bridgeton, Glasgow—Leather belting, pickers, cotton belting, buffalo skips, fire buckets, &c. Mr. Maurice Gandy, Wapping, Liverpool—Gandy's patent cotton belting and cotton canvas. Messrs. T. Fleming, Sons and Co., West Grove Mills, Halifax—Leather belting and leather for mechanical purposes, card clothing for carding flax, tow, jute, silk, China grass, and waste fibres. The Rosendale Belting Co., Newchurch—Woven hair, cotton, and linen belting, fasteners for belts, &c. Mr. R. H. Taylor, Trafalgar Street, Sheffield—Compound elastic piston, safety valve, and automatic lubricator. Messrs. John Blackburn and Sons, Cleckheaton, Yorkshire—Wool, cotton, and silk carding machinery, &c. Mr. A. R. Worth, Walker Street Mill, Rochdale—Tubular spindle band for ring frames, mules, throistles doublers, &c.

### Wool, Cotton and Linen Industries of Germany.

A Berlin correspondent writes: "The textile industry of Germany is, in all its branches, so far developed as to be in a position to compete with any other industrial nation under like conditions. There are countries which, owing to their geographical position, can get certain raw materials cheaper than they can be bought in Germany, and others which can command cheaper hands—like Belgium, for instance, where no law prevents the employment of children under a certain age in the factories. But under equal conditions Germany has attempted to compete, and in many cases has been successful. The increased demand for raw wool would have been expected to augment wool production in Germany, but the contrary has been the case. Germany, not so long ago, produced the finest wools, but the imported Australian wool, though much inferior in quality, is considerably cheaper, and has checked the production in Germany, notwithstanding all the efforts made to revive it. The quality of German wool in general is still decreasing, for sheep farmers find it more profitable to fatten the animals for consumption. For the latter purpose, crossbreeds are considered best, but the wool, in consequence, being no longer the principal object, becomes worse in quality. The German wool markets are yearly losing their former importance, as the prices for foreign wools—the importation of which is continually increasing—are determined now in London and Antwerp, where great auctions are held four times a year. For spun white yarn, the German spinners cannot compete with the Belgian spinning mills, which have introduced uninterrupted day and night labour, and are not hindered by legal regulations from employing child labour. Hitherto, these yarns have been in good request for great-coat making, but are no longer so, and decline accordingly. In coloured and mixed yarns, there is less competition, but the contest for cheapness induces the manufacturers to go on increasing the percentage of cotton, which has been raised from 20 to 30 per cent. to from 50 to 72 per cent. Tricot yarns for woollen undergarments and all sorts of articles of fashion are in good request. The same may be said of mungo yarn. The export of short-wool yarn to Scotland, Austria, and Russia has been ruined by Belgian competition, and by the high duties in Austria and Russia. Merino yarns, which hitherto have only been manufactured in England, are now largely produced in Germany, and find a good market, as the old predilection for foreign products is continually on the decrease here. Worsteds yarns, though in good demand, yield small profits, the number of spindles in Germany having been increased during the years 1878-83 by at least 50 per cent. The German product is so perfect now that it is considered, even by foreign weavers, as indispensable for first-rate cloth. Sayette yarns are depressed by over-production in Belgium and England, those of the latter country being still superior in quality. Merino knitting yarns are in good request. Zephyr yarns, which are known as Berlin wools in foreign country markets, have fallen into discredit by an agitation started in Berlin, intimating that the wool in the dyeing process is made artificially heavy to realise greater profits. In addition to this, the new American tariff of July 1, 1883, has not proved advantageous, and the United States, which used to be the best customers for this article, are beginning to emancipate themselves by their own industry. As to woollen goods, as cloth and buckskin, which are in good demand and sale, especially at Berlin, the centre of ladies' ready-made mantle and dress business, the export trade is not quite satisfactory. The quality of the wares must be considered first-rate, for even the French, who now show such dislike for everything German, buy large quantities. The business in Italy has been satisfactory for the quantities sold, but not equally so for the profits. Commercial transactions with Spain have suffered through the Carolina trouble, and much ground has been lost there. The United States are the best customers at present, though the high duties are very much felt. The exports to the Soudan have been entirely stopped by the war, and though the East now goes in more for German cloth than it used to, still it is not sufficient to compensate for what has been lost, especially as the traders in Egypt are still suffering from the effects of the cholera in 1883. The hopes raised by the exhibition in Australia have not been realised. China and the East Indies are overstocked, so that business there does not yield any profit. The Brazils, Chili, and La Plata States have bought to a large extent. Concerning other woollen and half-woollen goods, worsted cloths must be mentioned first. All factories for tinted weaving were fully employed in 1884 and 1885, as well as those for Jacquard weaving. The latter is getting to be the fashion again after a long pause. Austria and Russia, it is true, are lost to our exportation, their high duties having stimulated their own factories; but in England and the United States, where those articles are known as "Gera goods," they have even supplanted the French goods, which dominated the market there only a few years ago. Half-woollen cloths, not being the fashion, have been little in demand. Exportation, too, has been low, and foreign markets have been overstocked. Flannel factories have been fully employed for export, though the competition for cotton flannel is daily growing. Table covers have been sold in good quantities and qualities to England, yet at small profits; but, with

the United States, this branch of business seems to be entirely lost. The poncho business to South America still suffers from the insecure condition of political affairs. Business in coloured handkerchiefs, shawls, scarfs, &c., which are mostly manufactured for the East, the South of Europe and South America, has been bad, as, in consequence of political difficulties, people have refrained from buying, and the market has been overstocked with inferior wares. German carpet manufacturers in Brussels, Tournay, Velours, and Smyrna goods have not only pretty well conquered the German market, but begin now to compete in foreign markets. For raw cotton, Germany, like all European countries, is dependent on America and the East Indies. As the consumption of cotton articles is continually increasing, German mills might have realised good profits if England (the markets in East Asia being stopped by wars) had not thrown her surplus stocks on the German market at prices quite out of proportion to the prices of the raw material. Notwithstanding the high duties on foreign yarns, the German spinners do not yet compete in the production of the finer double yarns, so that the weavers have still to obtain such yarns from England, and the articles made therefrom cannot, for this reason, compete with the same English articles in the world's market. Spinning mills for water twists and warp yarns have had sufficient work, but, in consequence of English competition, the inferior qualities have been more in request than the finer ones. All factories for white wearings, such as cotton cloth, fustian, cotton beaver, printed calicoes, flannel, &c., have had good occupation, though at low returns. For coloured cotton weavings, the general complaint has been of low prices on account of over-production, and though some articles have been in good request for export, as, for instance, cotton handkerchiefs, the profits realised have been small. Velvets and velveteens are exported to France, England and New York at advancing prices. Notwithstanding the great progress in linen making, flax culture in Germany is not sufficiently developed to satisfy the demand, either in quantity or quality; the importations have, therefore, grown rapidly. During the last few years, considerable efforts have been made, and have proved that German flax, if properly treated, may compete with any production in the world, and as the raw material finds a good market in France, Belgium, and Scotland, the cultivation of flax has lately been on the rise again in Germany. Russia produces great quantities for the German market, but mostly of inferior quality. It is pretty nearly the same with hemp, oakum, and tow; Germany for the better part of her requirements is obliged to import the raw materials. As the demand for linen yarn has been greater than the production, all the spinning mills have had full work and good profits, but, being unable to meet all demands, great quantities of spun yarns have been imported from neighbouring countries. Threads, especially for sewing machines, requiring a fine, strong, and smooth thread, which the best flax only can yield, are mostly imported from England and Belgium. Linen and half-linen weavings are in good demand, above all the better qualities.

### Tariffs in the United States.

#### DUTIES UPON WOOLLEN AND MIXED GOODS.

Included in the report of Commissioner Wright, of the United States Labour Bureau, is a table showing the incidence of the Customs tariff upon imported woollen and mixed goods, which brings out very clearly the extremely onerous character of the duties imposed. As an example of the rates, we take the following, which gives in one column the price of certain classes of goods in Leeds, and in the other, the proportion which the duty bears to that price:—

Goods.	Price. \$ c.	Proportion.
West of England broadcloth.....	3 60	50'3
West of England beaver .....	3 36	56'3
Fine worsted coating.....	2 88	58'2
Indigo blue cheviot coating .....	2 40	65'5
Ottoman, woollen and worsted .....	82	72'0
Wool, fancy suiting .....	94	93'4
Wool, fancy suiting .....	70	103'7
Diagonal cheviot.....	76	107'0
Cotton-warp cloth .....	64	120'5
Fancy overcoating (cotton warp).....	82	125'7
Fancy overcoating (cotton warp).....	76	127'0
Cotton warp coating .....	40	128'0
Imitation sealskin .....	56	144'3
Cotton-warp melton .....	24	153'3
Cotton-warp serge melton.....	26	165'4
Reversible diagonal.....	48	167'1
Reversible nap.....	44	179'1
Cotton-warp reversible .....	45	180'7

From this it will be seen that according as the price of the article declines, the percentage of duty increases, which means that the duty presses most heavily upon the cheapest classes of goods, and consequently falls with the greatest severity upon the poorest classes of consumers. This, of course, is a characteristic of all specific duties, for it is impossible to frame a scale that discriminates accurately between the varying qualities of goods. It is a characteristic, however, which is too often ignored, and the bringing home to the people, as Commissioner Wright has done, of the fact that it is upon those of them who are least able to bear it that the heaviest burden of protective duties falls, should do something to aid the cause of Free Trade in the States.



## The Royal Commission on Trade.

### THE HEAVY WOOLLEN INDUSTRY.

The third report of the Royal Commission on Trade has been issued, and it contains some evidence of particular interest to the heavy woollen districts. Mr. Mark Oldroyd, a large employer of labour said "he represented the district of the Dewsbury and Batley Chambers of Commerce and the adjoining Local Board districts, which had a population of not less than 100,000, chiefly concerned in the heavy woollen trade. The district was the centre of the shoddy business. Shoddy was produced by tearing up woollen tissues. It was really the manufacture of old manufactured stuffs. The trade was developed at Dewsbury, which practically had the monopoly of it. The trade began fifty years ago. During recent years, the trade had been developed in Germany, Italy and France. He thought that was due to the tariffs, because those countries were in ignorance of the use of shoddy until those tariffs were imposed, and those special duties being resorted to instead of *ad valorem* duties told very heavily upon us. There was a general sense of depression, and complaint of diminished profits in the districts he represented. From 1870 to 1874 was a period of inflated trade. From 1875 to 1879 the inflation of the former period was quietly subsiding. From 1880 to 1884 we suffered very much from the increase of foreign and colonial tariffs. Notwithstanding that, taking the whole period from 1865 to 1874 there had been a large increase in the trade of the district. Since 1880, the profits had seriously diminished through the increase of foreign tariffs and the change of fashion, which had rendered alterations in machinery necessary. The specific duties by weight affected the district more than any other. The American duty, imposed in 1862, had proved almost prohibitive. In 1879 or 1880, they had increased tariffs in France, Italy, and Austria, while the tariffs in Germany and Canada had been absolutely prohibitive. The trade has been seriously affected by the change of fashion. Foreign competition was also injuriously affecting some branches of the trade. He could not say that there was over-production in the districts he represented. They could produce more if they had a larger demand. The trade of the district was in a state of expectation, not of despair, but hopefulness on the whole. As to the remedy for the depression affecting the trade, they would have to await the return of confidence, which would take place when there was a general conviction in the commercial world that they had reached the lowest level of prices in commodities generally. He was prepared to advocate the appointment of a Minister of Commerce. He would like, if possible, the statistical and commercial facts, that were collected by the different departments, to be concentrated and put before the country in an authoritative way under the responsibility of one chief. The statistics would have more influence in making both employers and artisans feel that they were unprejudiced, and that they had a distinct and marked bearing on commercial relationship. He thought some benefit might accrue by the extension of technical, scientific, and artistic instruction in the country. Those who had had the benefit of class education made better and more valuable workmen. He did not advocate a retaliatory system of tariffs. He thought we should get more good than harm by going on in our own way. He thought the depression had perhaps affected those parts of Yorkshire he had mentioned less than it had affected the country generally. The effect of the prohibitory duties in Germany had been to stimulate home trade, but he did not think it had affected the Germans in neutral markets. Taking a period of twenty years, he thought there had been a larger increase of the Yorkshire industries in proportion to the increase of the population of the civilised world. There had not been a large increase of mills, and some were standing idle. Four or five firms, he believed, had established branches in Germany, but that had not affected the number of people employed in Dewsbury. He did not think it a fair conclusion to arrive at to say that they found it more advantageous to work in a protected country. He

believed their expectations had not been realised. He entertained a hope that trade, in the Yorkshire district, would improve, as he believed that the fact that they were able to produce a fabric at a lower price than ever in their history would tend to increase consumption."

The final report of the Royal Commission has been prepared. The Commissioners, we believe, will announce that they do not find any evidence of depression of trade, so far as depression is taken to mean the restriction of trading operations. On the contrary, they find that the volume of British trade has continued to increase more than commensurately with the growth of the population, and that the general industrial condition of the country is satisfactory. Low prices and consequent diminution of profits will be held by the Commissioners to constitute the only evidence of trade depression. The Commissioners will report that there has been an unusually prolonged period of over-production, due mainly to the vast increase of wealth in the country, and to the competition arising from a superabundance of capital. The Commissioners do not consider that commercial legislation or statutory interference with labour arrangements have injured British trade, and they do not recommend any increase in the hours of labour, or diminution of wages. Their report will be found to be distinctly favourable to the trades unions of the country. The recent failure of agriculture will be held by the Commissioners to be the main, if not the sole cause of the diminution in the home trade, which will otherwise be described as satisfactory, while the condition of the working classes will be reported as much improved during the past two decades. The Commissioners will report a greatly increased competition, both in home and in foreign trade, on the part of European countries, especially on the part of Germany, which country is stated to be improving greatly in commercial enterprise, and pressing England closely, both at home and abroad. The recommendations of the Commissioners are not numerous. No fiscal alterations are suggested, nor will there be anything in the report pointing to fair trade, protective duties, or reciprocity as remedies. The Commissioners recommend that Consuls, Vice-Consuls, and other British diplomatic agents abroad, might render increased service to British traders by more frequent reports to the Foreign Office, and the reports, it will be advised, should be printed and circulated directly they are received. The Commissioners will also advise that British trade might be developed abroad by increased adaptability on the part of our manufacturers to the necessities of foreign markets. In this respect, it will be reported that British traders are inferior to their German competitors. This report is drawn up by the Earl of Idlesleigh, and will be adopted by the Commission, but it is probable that there may be further reports by minorities of the Commission and by individual Commissioners.

### Permanent Commercial Exhibition or Museum.

The interest taken by the London Chamber of Commerce in the establishment of so-called commercial museums (which are more truly permanent exhibitions) in Belgium, Holland, Germany, Austria, Switzerland, Italy, and France, has, we learn, taken a practical turn. The council of the London Chamber have decided to despatch their Secretary (Mr. Kenrie Murray) on a visit to the principal representative museums on the Continent, with a view of studying how far it would be desirable to create similar institutions in this country. Mr. Murray will, on his return, report upon the area of the buildings used as museums, the financial organization of those museums, and the annual expenditure, the number of visits which they have received, and the services which they may be considered to have rendered to the trades of the country in which they are situated. Special attention will be given to the German Export Samples Depôts, an improved system of which may possibly, through the co-operation of the Chambers of Commerce in the United Kingdom, and throughout the Colonies, be made to serve a useful purpose to the commercial interests of this country. Mr. Murray, it is understood, has been supplied with foreign office introduc-



tions to her Majesty's representatives, in the different countries through which he will pass. Over a dozen of the largest continental towns in which commercial museums exist, have been selected for visits, and Mr. Murray's examination of these museums will consume a greater part of the month of August. The report, it is expected, will be published in time for consideration, if desired, by the Court of Common Council, on the resumption of their sittings in September.

### Trade Reports by Her Majesty's Consuls.

#### IMPORTANT TO MANCHESTER MERCHANTS.

**TAIWAN.**—The consul writes reporting a very satisfactory increase in the amount of cotton piece goods imported into the province over previous years, and states that, with the exception of 537 pieces of American drills, all came from England. He says, "the amount is, however, exceedingly small, and I have only to repeat what I said in my report last year, that the staple English manufactures are quite unsuitable for the ordinary work-a-day clothes of the vast mass of the Chinese people. What I have to say under this head does not apply to Formosa only, but to the whole of this empire. The Chinese people wear native cloth, and wear nothing else. I have examined the clothes of labourers, who form the great majority of the people in two-thirds of the 18 provinces of China, and the fact is as I say. Our shirtings and cotton piece goods are only fit to be undergarments of the rich, the outer garments of the sedentary poor, linings, and grave-clothes. They are utterly unfit, whether in yarn, in make, in length, or in width, for the ordinary clothes of Li Chang, Wang, Liu, and Ch'ao, who, in millions, pursue their daily toil clothed in their own tough, rough, honest, untearable, and unwearable homespun from Kwantung to Kansuh, and from Szechuen to Chihli. So long, therefore, as we, with persistent conservatism, cater for the luxuries of the few and neglect the necessities of the many, so long will our export of piece goods to China be inexpensive, and, compared with the teeming millions of cotton wearers which make up the population of China, absurdly small. This is not a country where a cotton handkerchief and a turban, the one made of Lancashire rubbish, and the other of a light-weight shirting, suffice for clothing. From six to ten months every year, every Chinaman is comfortably clad in jacket, trousers, and underclothing, made of heavy cotton cloth, the product of Chinese fields, Chinese spindles, Chinese looms, and Chinese hands. Whether Lancashire is or is not excluded by the nature of this product or its cheapness from any participation in its manufacture and trade, need not be matter of speculation. I have made up samples of the six commonest Chinese kinds of homespun in universal use, as follows:—No. 1. Put'ang cotton cloth, the coarsest made, woven in pieces 24 feet long and 17 inches wide, packed in bales of 25 pieces, the bale covering being the same cloth, the selling of which is, in Formosa, 12 dols. 50 c. per bale, or 50 c. per piece. No. 2. Tsungming cotton cloth, less coarse than the foregoing, and of a much finer yarn, woven in pieces 60 feet long and 17 inches wide, packed in bales of 10 pieces with the same cloth, the selling price of which in Formosa is 19 dols. 50 c. per bale, or 1 dol. 95 c. per piece. No. 3. Shih Chuang Chung Ching cloth, an open texture coarse cloth, much used as mourning robes by all classes, packed in bales, of 25 pieces, each piece 25 feet long and 18 inches wide, sold in Formosa at 10 dols. per bale, or 60 c. per piece. No. 4. Shih Chuang Shang Ching cloth, in common use for ordinary clothes, woven of a much finer yarn than any of the preceding, in pieces 25 feet in length, 17½ inches in width, packed in bales of 25 pieces in cloth of the same kind, and sold in Formosa at 11 dols. 25 c. per bale, or 55 c. per piece. No. 5. Tan Chuang cotton cloth, same as the preceding, but woven more closely of finer yarn, in pieces 28 feet long and 19 inches wide, packed in bales of the same cloth, consisting of 25 pieces, and sold in Formosa at 16 dols. 50 c. per bale, or 76 c. per piece. No. 6. Mei-Kwo American cotton cloth, apparently the best cotton the Chinese can make, woven in pieces 60 feet long, 22 inches wide, packed in tin-lined wooden boxes containing 100 pieces, and sold in Formosa at 1 dol. 75 c. a piece. This sample I submit with some diffidence. In texture, and packing, and name it is "got up" in colourable imitation of "P.M.C.D.," or some other well-known American sheeting. I am assured, however, that it is really a Chinese homespun in great demand called "American," because, to our shame be it said, "American," from the point of view of the Chinese dealer, is synonymous with "excellent." However, I have doubts as to its origin, which my inexperience in these matters cannot solve, although its width would seem to mark its native origin. These cloths, with the exception of sample No. 3, are not worn white, but dyed in one or other of eight shades of blue, of which I have also prepared samples. The dyeing is done at a cost of 20 to 26 cents per piece for light shades, and 40 to 48 cents for dark shades, by dye-houses situated in the locality where the cotton is sold. I send along with this report eight packets, each containing a series of samples of these six kinds of cotton cloth, with a card attached to each series, showing the tints of blue in which the cloth is worn. I suggest that two be sent to the Manchester Chamber of Commerce, and the rest be

distributed amongst the other leading industrial centres in Lancashire. I regret that I am unable to add the weights of each piece, but I have transmitted 20 ft. of each kind to Messrs. Bell and Co., No. 7 Portland Street, Manchester, who will, doubtless, calculate the weights, and supply them to any inquirers with the same readiness that I have, in reply to their request, supplied them with the stuff itself. The Formosan selling price is no exact index to cost price, but a rough approximation may be got at by deducting two profits—import duty and freight from the mainland—from the price I have named, say 15 per cent. Exact information as to cost can only be obtained at Shanghai or at the lower Yangtze ports. The most casual inspection of these samples by an expert will show at once whether such stuffs can be produced by mules and power-looms, or whether there is something in hand work which machinery cannot imitate. And if they can be so produced, a simple calculation, based on current rates of exchange, and laying down cost in China, will show whether it would pay us to produce them. If they can be produced at a paying rate, we have in China a practically illimitable market; if they cannot, we need not expect to see any great increase in the consumption in China of English cottons, so long as trading facilities and internal communications remain as they are. As things are, the country is fairly tapped except in two directions—the West River Valley in the province of Kwang-tung, and the great basin of Eastern Szechuen; and the import varies in an elastic way between a well-known maximum and minimum point, because the cottons we send are not necessities which China must have, but luxuries which she can get along without, and will only buy when she can afford them.

**JAFFA.**—Mr. Consular-Agent Amzalak reports that the imports and exports at this port have increased during the last year. The low prices in Europe for wool have induced the peasantry in the interior of the country to increase the number of the manufactories for making "abayes," or peasant coats, which pays them better than selling their produce of wool to the market here, where the prices are as low as the foreign ones. Jaffa is provided with cotton manufactures through Beyrout. These goods are chiefly of Manchester manufacture.

**TREBIZOND AND SAMSOON.**—A decrease in 1885, says Consul Longworth, in his report, as compared with 1884, is perceptible in the general trade of Trebizond. The amount of decrease is £260,620, of which only £8,510 affects Anatolia, and no less than £252,110 Persia. The exports from Anatolia by steamers and sailing vessels show a decrease in quantity by 19,870 cwts., and an increase in value by £7,700, the exports to Great Britain having diminished by £20,850. Native manufactures, consisting chiefly of Aleppo goods, such as cotton, blue cloth, striped cotton, and silk stuffs, have increased by about £10,000. Imports to Persia show a decrease of 1,950 cwts., £123,250, the loss to Great Britain being £125,600. The Persian imports showing a decrease are:—Cotton goods by 2,380 cwts., £126,120, attributable to mercantile failures in Persia. An inferiority in the quality of these goods is noticeable. The general trade at the port of Samsoun shows an increase of 431,830 cwts., £92,880, of which £42,970 stands as the share of Great Britain. The establishment of a commercial bank at Trebizond and an agricultural bank at Samsoun, would doubtless greatly improve business transactions in these ports, for capital is at present only lent out at usurious rates of interest; and money changers seem to be realising unreasonable profits from poor and rich alike, through local fluctuations of foreign coins, which, for lack of small Turkish pieces, continue in great circulation, notwithstanding prohibitory orders from Constantinople. As an instance of this may be given the fact that the Indian rupee and the Russian rouble in this market fell last year, the one from 10 to 8, and the other from 16 to 3 silver piasters in their rate of exchange. One cannot too strongly impress on British steamship companies the advisability of establishing a regular line of steamers to Samsoun and Trebizond—the one known as a port of the grain-yielding country, and the other as an emporium of British imports to Anatolia and Persia. If the experiment be persisted in, though attended at first by loss, there is reason to think it will eventually turn out profitable. The population of the valayet of Trebizond, which numbered to about 1,000,000 souls, appears by the census of last year to have increased 30 per cent. Local industries appear of late to have suffered much, particularly domestic weaving of silk and cotton stuffs. It may be observed that the commercial depression in general is mainly due to the increasing poverty of the people, who, in these hard times, are depriving themselves of many wants, and show a preference for articles of a cheaper and inferior quality to a degree that, last year only, goods have depreciated in value from 5 to 10 per cent. The prospects of trade will never be brighter as long as imports continue in so great an excess of exports, and hence even the most sanguine here must look to the future with a certain amount of misgiving.

The President of the French Republic, on the advice of M. Lockroy, the Minister of Commerce, has decreed the institution of honour medals to be adjudged to workpeople or clerks who can show thirty years of uninterrupted employment in the same commercial or industrial establishment on French territory. The medals, which are of gold, silver, and bronze, bear on one side a female head symbolical of the Republic, surrounded by the words "*République Française*," and on the reverse the words "*Honneur et Travail*," with the names of the rewarded persons. They are to be worn suspended by a tricolour ribbon. The award will be accompanied by a diploma setting forth the services for which it is made.



## EMINENT TEXTILE MEN. No. 3.

## Swire Smith, Esquire.

Amongst our Eminent Textile Men, none is more worthy to occupy a leading position in the manufacturing world, or more deserving of the gratitude of his countrymen, than the subject of our present sketch—Swire Smith, Esquire, a gentleman who has grudged neither time, strength, nor money, in order that he might learn the secret of the success of foreign competition against our country, and having learnt the cause, that he might promote means whereby those interested in manufacturing, in all its branches, might acquire scientific knowledge and skill which would enable them to cope successfully with their trade rivals. Mr. Swire Smith is a worsted spinner, and senior partner in the firm of Messrs. Smith and M'Laren, Springfield Mills, Keighley. Mr. W. S. B. M'Laren is M.P. for the Crewe Division of Cheshire. For several years past, Mr. Smith has been an active promoter of Mechanics' Institutions and of Technical Education as applied to the Textile and other industries. He acted as Hon. Secretary of the Building Committee of the Keighley Mechanics' Institution and School of Science and Art—along with Alderman B. S. Brigg, the first Mayor of Keighley—when the scheme of an Institute appropriate to the wants of the town was projected about 20 years ago. (The building was erected at a cost of nearly £20,000, and was opened by His Grace the Duke of Devonshire, in 1870.) These gentlemen have acted as Hon. Secretaries from that time to the present. A new wing is now being added to the Institute, at a cost of about £10,000, which will supply Designing and other Class-rooms, Workshops, Chemical Laboratory and Museum, for the more complete equipment of Technical Education in Keighley. In 1872, Mr. Smith visited a number of the factories and weaving establishments in Germany, which were being supplied with yarns by Yorkshire spinners. He observed that very elaborate fancy goods were being made upon Bradford machinery from Bradford yarns, and that the dyeing of the yarns and pieces, and the processes of finishing were very efficiently managed. In many instances, Bradford yarns, both warp and weft, were being manufactured into pieces in Germany, sent back to England for sale, and were being preferred to those of Bradford, not because of greater cheapness, but because of the attractiveness, or novelty of the fabrics themselves. Continuing his inquiries, Mr. Smith ascertained that, in the German factories, competing so successfully with our own, the designers had been trained in the principles of Art—some as artists;—employers, managers and overlookers, had attended designing and weaving schools; and, in nearly every instance, the chief dyers had been instructed in the science of chemistry. For the purposes of supplying the Technical Instruction for manufacturing operations, Mr. Smith found Schools of Art, Industrial Workshop Schools, Polytechnic Schools and Chemical Laboratories in Germany, France and Switzerland, some of which he visited. These Educational Institutions had been established, and were being lavishly supported by foreign governments and municipalities, with the object of overtaking England in manufacturing pursuits. The progress of foreign manufacturers had already alarmed English manufacturers; and Mr. Smith, in addresses at Mechanics' Institutes, Chambers of Commerce, and before other public audiences, has vigorously exposed our deficiencies, and advocated the promotion of Technical Instruction. He has also issued a pamphlet entitled "Educational Comparisons," which has passed through two editions, and has been extensively circulated by the Yorkshire Union of Mechanics' Institutions. For several years, Mr. Smith has been a member of the Bradford Chamber of Commerce, having served three years as vice-president, but was unable to accept the offered position of president, in consequence of other public duties. In economic matters, Mr. Smith is a staunch free trader, having taken a leading part in the discussions on Fair Trade in the Yorkshire Chambers of Commerce, and also at the meetings of the Associated Chambers of the United Kingdom. He has invariably argued that, "instead of taxing the imported products of foreign skill and taste, we had better improve the skill and taste of our own manufacturers and artisans," and that "it is too late in the day for England to protect ignorance or indolence." When, in 1879, Mr. S. C. Lister, of Manningham Mills, lectured on "Free Trade in Corn and Protection of Labour," Mr. Smith replied to him in a lecture which he delivered in several Yorkshire towns. As a result of the discussions in parliament and throughout the country on Foreign Competition, and the backward state of artistic and scientific education in the United Kingdom, the Royal Commission on Technical Instruction was appointed, in 1881. In its composition, it was industrial as well as educational, and the members were selected from the leading industries, so that special knowledge could be brought to bear upon the inquiry into the state of foreign manufactures and education in the widest sense. Sir Bernhard Samuelson, Bart., M.P., represented Iron; Mr. John Slagg, then M.P. for Manchester, Cotton; Mr. Swire Smith, Wool; Mr. Wm. Woodall, M.P., Pottery; Sir H. E. Roscoe, M.P., Chemicals and Higher Science; Mr. Philip Magnus, Director of the City and Guilds of London Institute, General and Technical Education; Mr. J. R. Redgrave, of South Kensington

Museum, acted as Secretary. These gentlemen made several important journeys to the Continent, visiting the leading factories and workshops, and the leading schools of France, Germany, Switzerland, Belgium, Holland, Austria and Italy. They also visited the great seats of industry, and the important schools of the United Kingdom, for the purpose of comparing the industries and the instruction of the industrial classes in this country with those of the corresponding classes in other countries. Sir H. E. Roscoe and Mr. Swire Smith also subsequently visited the United States of America and Canada in pursuance of the same objects. The Report of the Technical Commission comprises five bulky volumes, representing enormous labour on the part of the Commissioners, and containing a vast amount of information relating to foreign schools and manufactures. The branch of the inquiry to which Mr. Smith paid marked attention, and to which he was specially delegated by his colleagues, was inspecting the manufacturing establishments and weaving schools of the various countries visited. The question of reporting on industries was one of great delicacy. In educational matters, every enthusiastic Director or Professor describes his work in detail, and is never so flattered as when the fullest notes are taken of his methods of instruction. The Commissioners received reports, prospectuses, and, in many instances, detailed plans of the principal Technical and other Schools. In visiting manufacturing establishments—as all commercial men will readily understand—the same openness could not be expected, and, generally speaking, note books had to be discarded. Yet Mr. Smith's notes, mainly recording the visits to industries and the conversations with employers, managers, workmen, and others, who favoured the Commissioners with their opinions upon industrial and educational questions, were considered to be so important, that they were printed in a separate volume for the private use of his colleagues. Any one desiring to obtain a condensed account of the leading Continental industries may do so on referring to the 1st volume of the Second Report of the Technical Commission. He will there find information as to the rates of wages and hours of labour, the influence of piece work, the division of labour, protective duties, the military systems, the influence of Technical Schools, and the many other conditions which, in each Continental State, more or less, affect the cost of production and the quality of the manufactures. He will also find a full account of the Schools of Art, the Designing, Weaving, and Dyeing Schools, and the testimony of manufacturers as to the help which their industries have derived from them. On the completion of the Bradford Technical College, Mr. Smith was able to render valuable service to the council (of which he has been a member since its foundation), by preparing the scheme of organisation, which, after much discussion and some modifications, was adopted for the various departments. In the autumn of last year, Mr. Smith was invited, by the Council of the Technical School at Belfast, to confer with the leading men of that city as to the development of Technical Education. He was accompanied by his colleague, Mr. Woodall, M.P., and they visited the most important of the linen factories and print works, the artistic printing establishment of Messrs. Marcus, Ward and Co., the School of Art, and Queens' College. A large and influential meeting of the manufacturers and commercial men of Belfast, Mr. Smith read a paper on "Technical Instruction as applied to the Linen Trade," of which some thousands of copies were afterwards distributed. More recently, Mr. Smith gave an address to the Chamber of Commerce, Leeds, on "Trade Depression and Technical Education," and at the Conference of the Yorkshire Union of Mechanics' Institutions, recently held at Ripon, under the presidency of Sir Edward Baines, he read a paper on "Night Schools," which, by a resolution of the Conference, was printed for extensive circulation. He has given another lecture on "Industrial Art Schools on the Continent," and one on "English Labourers and their Continental Rivals." In the preparation of the Catalogue of the International Inventions Exhibition, held in London in 1885, the groups of Inventions were prefaced by papers relating to each group, which were prepared by men of eminence selected by the Council. Mr. Swire Smith was invited to write the preface to the Manufacture of Textile Fabrics. The paper contains a brief history of each of the leading textile trades—Cotton, Wool, Silk, Flax, &c., with an account of the principal inventions in each branch of industry. The paper was afterwards published as a separate pamphlet. Mr. Smith also acted as one of the Jurors of Textile Fabrics and Machinery at the Inventions Exhibition, and for his services was awarded a Bronze Medal and Diploma of Honour. On Wednesday, the 21st of July, of this year, Mr. Smith was invited by the Worshipful Company of Clothworkers to their Hall, in Mincing Lane, London, in pursuance of the following resolution which had been unanimously carried at a previous meeting:—"That the Freedom and Livery of the Company be presented to Swire Smith, Esquire, of Keighley, in recognition of his eminent services to the cause of Technical Education." At a dinner given by the Clothworkers' Company, on the same evening, attended by several distinguished Colonial visitors and others, the Master, in proposing the health of their youngest member of the Guild, referred in high terms to Mr. Smith's connection with the Technical Commission, and to his education labours. In responding to the toast, Mr. Smith stated that this country is now importing yearly foreign manufactured goods to the value of £40,000,000, of which £25,000,000 are textiles, and this because of the deficiency in suitable training, for whilst our rivals have been carefully educated in all that would tend to make efficient masters and skilled workmen, but little attention has been paid, until comparatively recently, to these subjects at home.





Our first plate contains the third of a series of Portraits of eminent Textile Men. Swire Smith, Esquire, of Keighley, Yorkshire, is the subject, a description of whose work is given on page 17 of this Journal.

The second plate, a handsome sketch, is from the pencil of Mr. F. Layton, Akroydon, Halifax. The design is for a Table Cover, which may be made in various materials.



**Wool.**—The wool trade, in nearly all its branches, has maintained a marked steadiness in demand during the month, and prices have generally had a hardening tendency. Botany wools have sold fairly well to manufacturers who were disposed to cover orders they had in hand. English wools generally have not shown much change in demand, whilst prices may be quoted higher. A fair business has been done for export account to France, Germany, and the United States. The yarn trade has kept fairly well employed, and spinners have asked higher rates, but it has been with extreme difficulty that they have been obtained. Two-fold yarns have only sold moderately well, whilst a good business has been done in tube and single yarns for export, and fair prices have been obtained for these classes. The finer counts of Botany yarns have met a fair sale at prices in advance of a month ago. On the whole, spinners are more favourably situated than for some time past. Manufacturers complain of severe competition in most branches of their business, and of the small demand for the Continental and home trades. The coating trade is the most satisfactory, the demand for America keeping up fairly well, although there has been a smaller quantity sent to that country during the past month.

**Cotton.**—There has been about an average business passing in the raw material, but prices have been generally weaker during the month, as spinners have only bought to cover orders. The yarn branches are in an unsatisfactory condition, through over-production, and in order to alter this state of things, a meeting was held on the 3rd instant, in Manchester, of 300 of the leading spinners in Lancashire, and resolutions were passed to run short time for a period of six weeks, from the 15th instant, on condition that two-thirds of the spinners agree to carry out this resolution, and efforts are being made to induce other spinners to follow their example, and thus rid the market of the accumulated stocks. The cloth branches are in but little better position than the yarn trade, prices being such that manufacturers say it is impossible to keep their machinery going much longer, unless a better order of things speedily exists. There has been a fair demand for light kinds of goods for export to the East, but other descriptions have not sold well. Prices are lower for most classes of goods.

**Woollen.**—This branch has been steadier, and prices have gradually advanced for most classes of fabrics. Worsteds still meet with the greatest favour, and seem likely to find a steady sale for some time to come. There are some very effective cloths being produced in fine goods in new designs and colourings, there being no limit to productions of this kind. The medium classes still find a market, but not in such readiness as the better kinds. The finer qualities of woollens are also meeting with a fair demand, some really admirable fabrics having recently been put upon the market. The clothing trade is still taking a large quantity of the lower makes of woollens, and some really saleable cloths are being produced in this branch. Full time is the general rule, whilst some mills are making much overtime.

**Linen.**—This trade has been slightly better, and, on the whole, prospects seem a little brighter for the future. Manufacturers still complain of the smallness of profits, saying they are almost *nil*. Figured cloths of good design have sold moderately well, but at no advance in prices. The flax trade has improved, and rates have had a hardening tendency. Jute goods have sold more freely, and the outlook is rather brighter. Jute yarns have also passed fairly well, and the demand seems likely to continue for a time.

**Lace.**—No change can be said to have taken place during the month. The curtain branch may be a little better, but there is still much machinery in this department unemployed, and although some very effective fabrics have been produced by manufacturers, they do not seem to meet with a greatly increased sale, and no improvement in prices takes place. Frillings, ruchings, edgings, and such like goods, still have a fair demand, but there is not a ready sale for other goods. Silk goods have been dull, and the hosiery branches show no improvement.

### The Table Cover Trade.

The Germans of late have been sending over some very cheap printed table covers to this country. They are of various descriptions and sizes, commencing from those of a small size, which are to be had for as little as 22s. 6d. per dozen, to the usual 8/4 size. These are merely printed in suitable patterns upon a thin woollen cloth, in which vigonia appears to form a considerable portion, having all the appearance of a fine woollen cloth or baize, and which can, doubtless, be produced cheaply on account of the predominance of the vigonia yarn, which forms a showier kind of material for the money than any that English manufacturers can produce, or, at all events, have as yet produced, and the Germans appear quick to seize upon the proper adaptation of articles to certain purposes. Other kinds of table cloths of the tapestry order, as respects style and appearance, are brought out at low prices, considering their excellent effect. A cursory examination would not allow us, with certainty, to pronounce of what they are composed, as we had no opportunity of ravelling out a piece at the edges, the cloths being finished with a fringe, but they appear to be a mixture of jute and cotton. Jute has often been tried in this country in the manufacture of articles removed from those of the very-lowest order common to this fibre, but the manipulation has not been very cleverly managed, considering that a fibre which in the higher numbers can be produced nearly as fine as silk, is to be obtained, and that, for a vegetable article, it takes colour well. The inferior articles that are made in Dundee, in the form of crumb cloths or carpet coverings, are very crude and unfinished compared with some of the goods that have been turned out by the Germans, in what may be termed the subsidiary or side branches of miscellaneous manufacture, but enough has been done to strike the keynote, and to show that this fibre is capable of more extended and more artistic application than it has at present met with in this country. *Appropos* of vigonia yarns, large quantities are exported to this country from Germany, and notably to Glasgow, where they are in request for certain classes of manufacture (they used to be largely used for shawl fringes, when shawls were fashionable), and it appears somewhat singular to us that English spinners have never turned their attention in this direction. In a producing centre like Oldham, where such large quantities of cotton are spun, and where trade is said to be at present very unremunerative, we are inclined to think that well considered experiments in the way of mixed yarn would be well worth trying.—*The Warehouseman and Draper.*

News comes from Vienna that the trimming trade of that city had represented to the Crown Princess (through Count Wilezek) that hundreds of workpeople had been thrown out of their employment in consequence of the falling off in the demand for braids and trimmings, consequent on the plainness of the jackets and dresses now generally worn. Her Imperial Highness has, in reply to the petition presented to her, ordered her dressmakers to use trimmings on all dresses to be made for herself, and has expressed her wish that all the ladies of the court and the upper classes generally should follow her example.



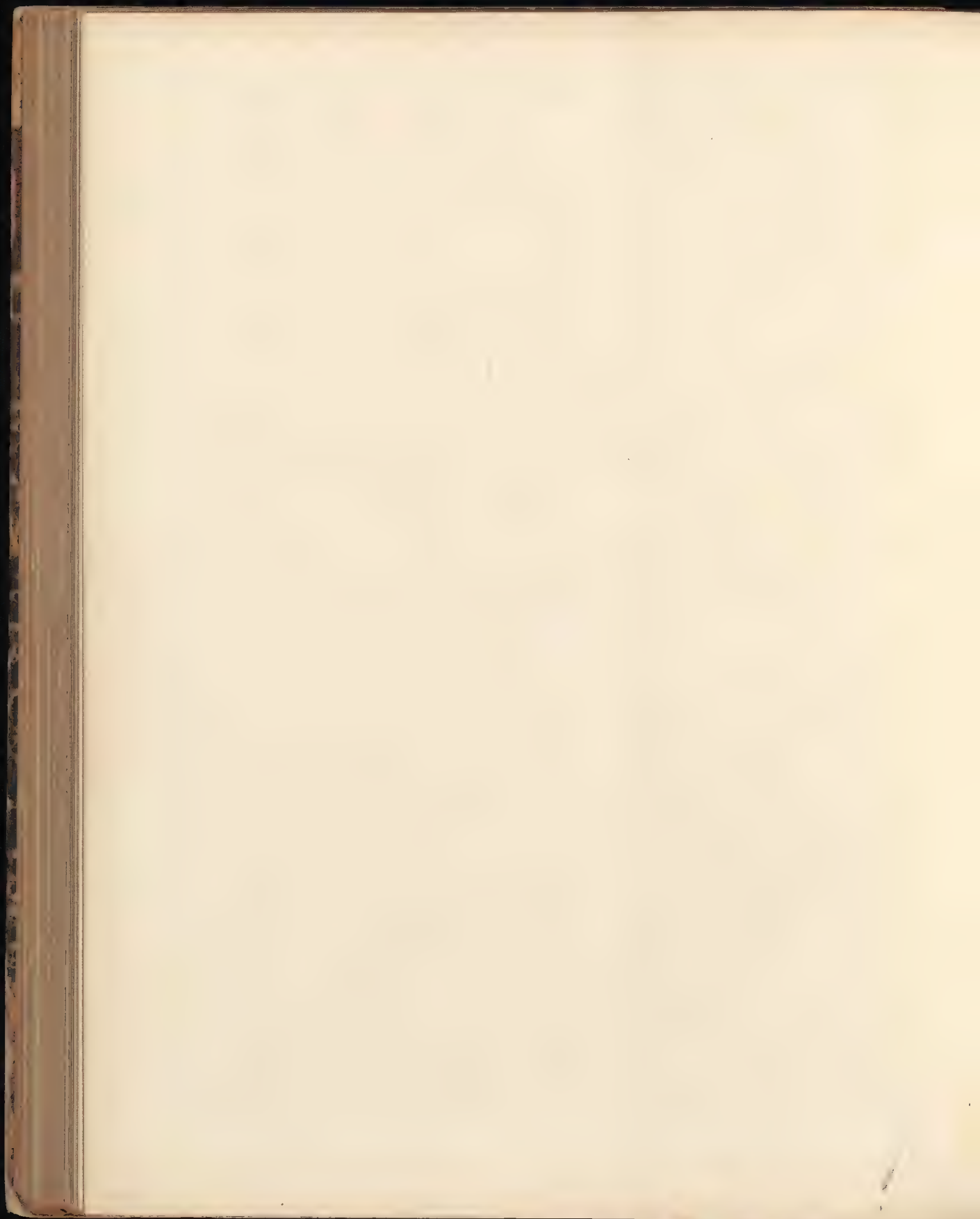
August 12th, 1886.

THE JOURNAL OF FABRICS AND TEXTILE INDUSTRIES.



EMINENT TEXTILE MEN.

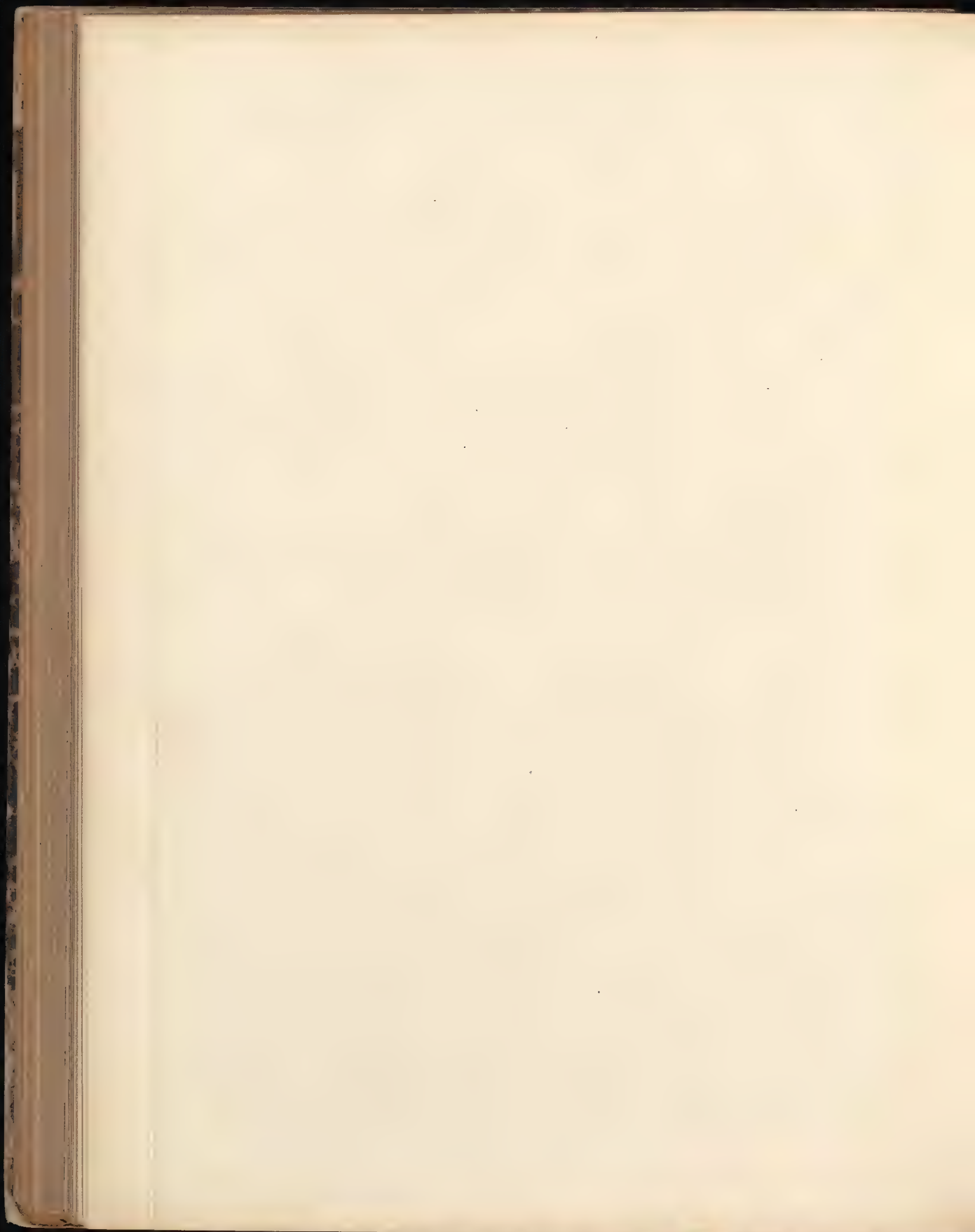
No. 3.—SWIRE SMITH, Esq.







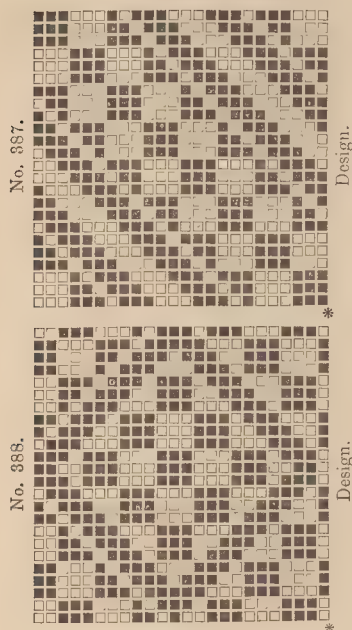
TAPESTRY TABLE COVER.





## ORIGINAL DESIGNS.

## Dress Goods.



No. 387.

Design.

No. 388.

Design.

Picks, 62.

Sett, 60's.

Warp, 30's.

Warp, 50's.

These particulars apply to Nos. 387 and 388.

## Fancy Woollens.

No. 389.



Design.

West:—2 Drab.  
4 Dark Lavender.  
2 Olive.  
4 Black.

12 picks.

72 picks per inch.  
72 ends per inch.  
4 threads in a reed.  
72 inches wide in the loom.  
56 inches wide when finished.

Warp, 20 skeins.  
West, 20 skeins.

Warp:—1 Dark Crimson.  
5 Dark Lavender.  
4 Black.  
2 White.  
2 Drab.  
4 Dark Lavender.  
4 Black.  
2 White.  
2 Drab.  
4 Dark Lavender.  
4 Black.  
2 White.  
2 Drab.  
4 Dark Lavender.  
4 Black.  
2 White.  
2 Drab.

62 ends.

West:—

No. 390. Warp:—  
1 Orange and Black.  
3 Dark Slate.  
4 White.  
4 Dark Slate.  
4 White.  
4 Dark Slate.  
4 White.  
4 Dark Slate.  
4 White.

32 ends.

West:—  
1 Crimson and Black.  
3 Black.  
4 White.  
4 Black.  
4 White.  
4 Black.  
4 White.  
4 Black.  
4 White.

32 picks.

60 picks per inch.  
4 ends in a reed.  
15's reed.  
66 inches wide in the loom.  
56 inches wide when finished.

2/60's skeins woollen warp.  
2/60's skeins woollen weft.

No. 391.

Warp:—



Design.

2 Olive. 35 picks per inch.  
3 Blue. 35 ends per inch.  
4 Black. 8 ends in a reed.  
9 ends. 70 inches wide in the loom.  
56 inches wide when finished.

Weft, all Black.

Warp and weft, self twist 12 skeins.

## Fancy Worsted.

No. 392.



Design.

Warp:—8 Dark Blue. West:—Dark Blue  
1 Light Grey.  
1 Black and White.  
1 Dark Grey.  
1 Black and Lavender.

56 picks per inch.  
56 ends per inch.  
4 ends in a reed.  
12 ends.

68 inches wide in the loom.  
56 inches wide when finished.

Warp and weft, 2/28's.

No. 393.

Warp:—1 Crimson.

West:—4 Black.



Design.

3 Straw.  
4 Black.  
8 picks.

8 ends.

Warp and weft, 2/28's.

56 picks per inch.  
56 ends per inch.  
4 ends in a reed.  
68 inches wide in the loom.  
56 inches wide when finished.

No. 394.



Design.

Warp:—

6 Black.  
2 Lavender silk.  
6 Black.  
2 Lavender silk.  
8 Black.

West:—6 Black.  
2 Lavender silk.  
6 Black.  
2 Lavender silk.  
8 Black.

24 picks.

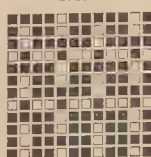
24 ends.

Warp and weft, 2/28's.

56 picks per inch.  
56 ends per inch.  
4 ends in a reed.  
68 inches wide in the loom.  
56 inches wide when finished.

## Ottoman Cloths.

No. 395.



Design.

Face warp—2/56's worsted.

Back „ —2/50's cotton.

Face weft —2/40's cotton.

Back „ —7's skeins woollen.

Face weft —4/12's cotton.

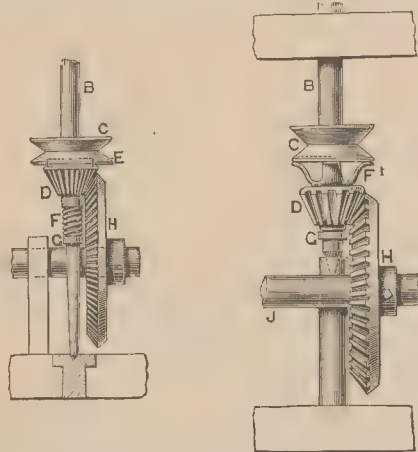
Drawn 1 worsted.  
„ 1 cotton.  
„ 1 worsted.

55 ends, face warp, per inch.  
28 ends, back warp, per inch.  
60 picks per inch.  
3 ends in a reed.  
60 inches wide in the loom.  
54 inches wide when finished.

## MACHINERY, TOOLS, &C.

### Improved Method of Driving the Spindles of Mules and other Spinning and Twisting Machinery.

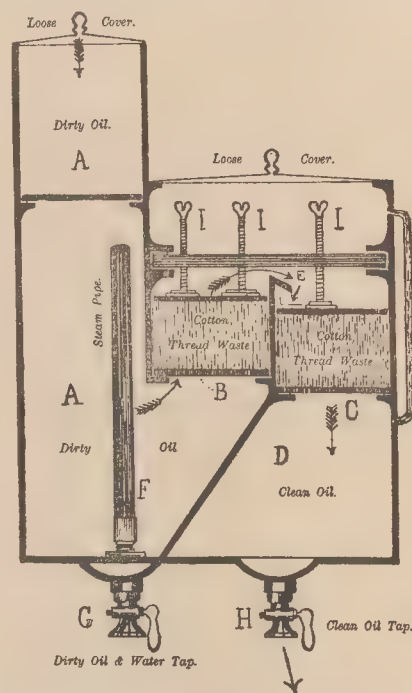
An improvement for driving the spindles of mules, without the use of bands, and which is equally applicable to other Spinning and Twisting Machinery, has been patented by Messrs. Greenwood, Butterworth and Gledhill, of Morley. Numerous improvements for this purpose have been brought out from time to time, but this seems of such great merit, that it will be of special interest to our readers. Spindle bands cannot be put on and kept in equal tightness where knots are used, and the latter cause more or less irregularity in the twist, and the former are, moreover, affected by the weather. Under this new system, it is claimed that complete regularity of twist is secured in the drawing and winding of the thread, and that it produces bobbins or cops of equal size. By the positive revolutions of the spindles, it stretches all the thickest threads the most, and eases the smallest, thus making the work more even in thickness. On the yarns being wound, it gives a greater length and, in hard-twined weft, it is not so liable to curl or snarl in the process of weaving or of twisting, and by the regularity of the twist, fewer threads are broken in the winding. By using this mechanism, one-third more weft or warp can be put upon a bobbin, and, consequently, time is saved in changing the shuttle when weaving, also, less waste is made by the yarn being wound tighter upon the bobbin. A saving of one quarter is also effected in the number of bobbins required and, in the same proportion, it reduces the risk of damaged places caused by the stopping and



the starting of the loom. The cost of renewing and putting on spindle bands is dispensed with entirely. With regard to the driving power used, it has been proved by tests, that less than half the amount that is required for band driving is necessary by the improved means. This ought to result in a considerable saving in most mills. Its power of winding the bobbin, or cop, can be increased without adding to the power of the mule or twisting frames, economising greatly in this respect. The spindles can be reversed easily, as they run equally well either way. Being much lighter to drive, and being unaffected by the weather (as are bands), a continuous and uniform speed is maintained throughout the year, and thus is ensured more work than can be turned out in a given time by the old method. For shipping purposes, yarns made by this mechanism will require considerably less space for packing, the cops occupying less room than tubes, and, being tightly wound, they do not become damaged so easily. We have seen the spindles running, and have no hesitation in saying that they work satisfactorily, and that they will therefore meet with much attention from spinners generally. From the annexed illustrations, the arrangements for the purpose will be seen at a glance, and its advantages made apparent. Fig. 1 B is the spindle, C is the wharve or wharve. D is the bevel, angle or helical wheel, which is loose upon the spindle B, and imparts motion to the spindle by means of its friction upon a washer E, or other suitable substance in, or upon, the under side of the wharve or wharve, (or other fixed collar) and the spring F; the amount of friction being regulated by the position of the collar G, the bevel, angle, or helical wheel is operated by a larger bevel, angle, or helical wheel H, upon a shaft J, which is driven by a suitable pulley, or other gearing from the spindle or driving shaft of the frame; or, instead of the spring F, a spring friction washer F1 may be used, or any other suitable means of applying the friction may be employed. Fig. 2, shews spindles in elevation driven by bevel wheels, from a shaft directly under the centre of the spindles.

### A New Oil Filter.

A very ingenious mechanism for the filtering of oils that have been used for purposes of lubrication, &c., has been brought under our notice by the firm of L. Hartley and Co., Henry Street, Bradford, who have secured the agency for Great Britain and Ireland. At the present time, a large quantity of, what is looked upon as, waste oil, is sold at a low price as unfit to use again for the same purpose, a great loss being thereby incurred yearly, especially by large users of lubricants. By the aid of the filter we are about to describe, this dirty or waste oil may be acted upon in, and brought out of, the filter almost as clear as before it was first used, free from both dirt and water. We give a front view of the filter, which consists of an iron apparatus, having in the inside a number of compartments. A is the receptacle for putting in the dirty or waste oil. B and C are compartments filled with cotton waste to act as filters. D is the tank into which the clean oil filters. The action of the apparatus is as follows:—The dirty oil is put into the upper portion of A, when it falls to the bottom of the compartment; it is necessary that this should be filled as nearly as possible, as it is required to rise through the filter B, this it does gradually, leaving a



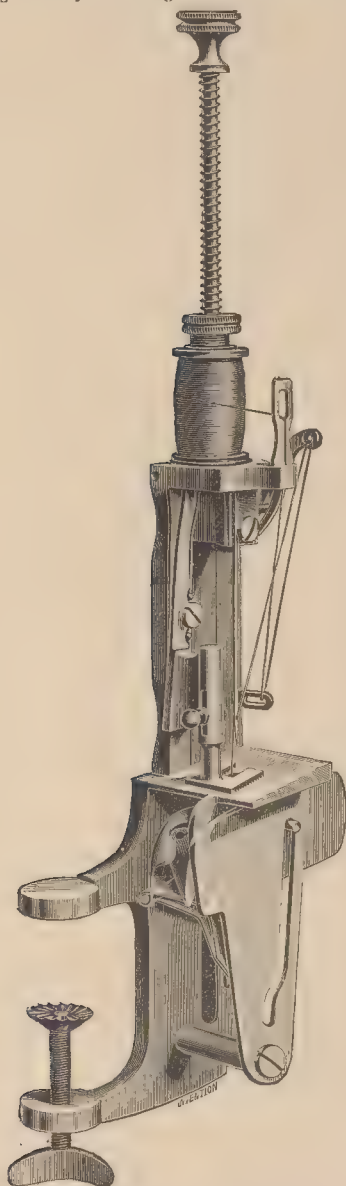
portion of the dirt behind it in the cotton waste; the oil continues its course and falls over the bar E into the tank C, filters through this bed of cotton also, leaving behind it the remainder of any dirt or other foreign substance, and then falls into compartment D, being again fit for use. Where very thick oil is used, it is necessary to have a pipe F connected with a steam pipe, as the heat thus given thins the oil, and allows it to move through the filter beds more freely. The dirt and water are removed by the tap G, and the filtered oil by the tap H. The screws I regulate the speed of the oil through the filter beds. We have inspected the apparatus in working order, and have found that it answered its purpose most satisfactorily in every respect. For all millowners, and others using oils, it is indispensable, and it will undoubtedly save its cost in a very short time. The mechanism is both simple and effective; it is substantial, and has no parts liable to get out of order. It needs next to no attention, the tanks B and C requiring only new supplies of cotton waste when necessary. On the Continent, it has already had a large sale, having been adopted by some of the best firms in France and Germany, a list of which, numbering over 130, have been supplied to us.

### The Moldacott Pocket Lock-Stitch Sewing Machine.

There has been recently exhibited at the Inventions Offices, 54, Fleet Street, one of the smallest and most compact machines for domestic purposes ever offered to the public. It is a perfect lock-stitch sewing machine, so condensed in form that it weighs less than one pound, and can be carried in a lady's pocket. It is capable of sewing the finest or the thickest materials of ordinary wear, and as the sale of the "little wonder" is expected to be very great, the retail price is fixed at half a guinea. We give a drawing of the machine, from which an idea of the simplicity of its mechanism may be gained, and from which it will be observed that all but the absolutely necessary working



parts of a sewing machine are dispensed with. This simplicity of construction reduces the liability to getting out of order to a minimum. There is no heavy bar, no stand nor wheel in the machine. It is fastened by means of a clamp and screw to the edge of a table, chair or to any surface that the clamp will grasp. The working action is by means of gentle pressure of the knob at the top, when the needle plunges downwards and is returned by means of a spring immediately the pressure is removed. The downward stroke can be repeated at any speed, 250 a minute being a low average, and the action is said to be less fatiguing than that of the rotary motion, and the "Singer" or any other straight needle can be used. The needle



bar above the head where the needle is fixed is formed with a second bar, which passes through a projection, and on which a spiral spring is placed, which, after being depressed, causes a self-acting lifting of the needle bars. The head is provided with a pin which actuates the thread-guide; the cloth presser and feeder, on account of its position, is actuated by this head, and the shuttle receives its motion by means of a segment, which latter is attached to a bracket by means of a boss on which it is movable and, being formed with a slot, works the pin fixed on the first needle bar. In order that the needle may not come into contact with the shuttle or pin, the projection is formed on the cloth plate. The shuttle rests in a basket, which is fixed to the segment by means of the bracket, the back of which, being hinged,

may be opened, and is caused to lock self-acting by means of a spring. The lower thread is guided from the bobbin through a hole, and the upper thread runs from a bobbin through the tension holes, and then through the hole formed in the projection eyelet and guide-lever into the needle. If the needle is depressed, and the pin below the double bend of the slot, the shuttle will not cover the slot formed in the projection for the reception of the needle, and is caused to take up so much thread by the motion of the guide lever, thus projecting and forming a loop, which on its return is caused by the point of the shuttle, and completely drawn through by the latter, whereby the necessary loop is formed by the lower thread. The machine is the invention of Mr. Rosenthal, a German gentleman, and so far as a close investigation of other machines can prove, there is no infringement of any patent right in this production. It will very shortly be ready for sale, and will, undoubtedly, prove of immense advantage to our "sewing public."

### Hunter's Anti-Corrosive Composition for Removing Incrustation in Steam Boilers.

Mr. E. Hunter, of St. James' Street, Leeds, exhibits at the Liverpool Exhibition his Anti-Corrosive Composition, for removing and preventing Incrustation in Steam Boilers; and also shows specimens of Incrustations which have been removed by the aid of his patented material. To the uninitiated, the sight of these samples would suggest something of the nature of stones for the purpose of making macadamised roads, but when they are told that they are the accumulations of deposits from water, which gradually fix themselves to the inner surface of the boiler, they seem somewhat incredulous. The composition which effects the removal of this deposit is in a liquid form, and, in use, may be diluted more or less according to requirements, it is then introduced into the boiler, and acts upon the incrustation in such a manner that it speedily destroys certain properties that this corrosive contains, and it may then be easily removed. The liquid is the result of long years of patient research and unwearied experiments, Mr. Hunter being ultimately rewarded by the production of a remedy for these evils, which has since benefited the users of steam boilers to a considerable extent, and is already considered one of the best articles for the purpose for which it has been invented. In its action upon the incrustations, it works on that alone, and it in no way injuriously affects the properties of the iron plates of the boilers, as the preparation is of a vegetable substance, and, by analysis, has been proved to be perfectly free from any ingredient of an acid nature which would corrode iron. This fact greatly increases the value of the composition, its advantages being thereby of a superior order. Its action upon the steam in a boiler is like that of an efficient lubricant, as it softens it in such a manner that any deposit is easily carried off, without the danger of its adhering to any portion of the boiler. From tests that have been made in competition with other compositions, Mr. Hunter has come out very successfully, and judging by the numerous testimonials given, expressive of its efficiency in removing deposits, we are satisfied that he has an article of superior merit. It is not for us to go into the matter of the great saving of coals, &c., resulting from having these incrustations removed, or from preventing the formation of them, as our readers will be able to judge the value for themselves. Mr. Hunter will send particulars on application to any correspondent.

### "French Fashions"—or German?

The gradual Germanization of France has lately taken a new and alarming departure. In the last century, as every one knows, Germany, like the rest of the world, was a humble tributary to the art and taste of France. This tribute continued to be paid even while the other kind of tribute, the war milliards, was flowing in the other direction. But the current is now in a fair way to be reversed. It is in this wise. There are five leading "journals of fashion" published in Paris, namely, *La Saison*, *La Mode Universelle*, *Les Modes Parisiennes*, *Les Modes de la Saison*, and *La Mode de Paris*. They all belonged to the same proprietor, a M. Thiron, who, however, has lately died; and the whole concern has now been bought up by a German! This enterprising gentleman is making the most of his purchase. Take *La Saison*, for instance. A German edition is published at Berlin simultaneously with the French one at Paris; and as to this latter, although the actual printing is done in Paris, the designs and the engraving are all German. Nor is this all. Herr Lipperheide, the proprietor, does not scruple—so the French say—to puff German goods with which Paris is already inundated—"French silks," which are made at Creffield, Limbach, and Fürth; "French textures," which are made at Elberfeld and Augsburg; "French ribbons," which come from Barmen, and "French clothes" from Chemnitz and Schmoeln. That would be bad enough; but it is not the worst, for under cover of the "French mark" these same German goods are being actively pushed—thanks to the good offices of "French" journals of fashion—in Prussia, Austria, and America. Decidedly the astute Herr Lipperheide deserves, if all this be true, a handsome subvention from Prince Bismarck.



## The Commercial Treaty between France and China.

The negotiations between France and China for the arrangement of the terms on which trade is in future to be conducted across the frontier between Tonquin and China, which dragged their slow length along for nearly a year at Tientsin, have been completed, and the result of the labours of M. Cogordan, Li Hung Chang, and their numerous assistants, has at last reached Paris for ratification. By the first article of the treaty, China agrees to open two places to trade—one on the frontier beyond Langson, the second above Laokai. The first of these will give access to the rich and populous province of Kwangsi, the other to Yunnan. This provision is not new, as it was contained in the treaty of peace signed at Tientsin on June 9th, 1885. China will establish Customs stations at these places, while France gets the right to appoint Consuls to reside there. This clause also arranges the method in which the places are to be selected. The second clause provides for the appointment of Chinese Consuls in Hanoi, Haiphong, and other towns in Tonquin, with favoured-nation treatment. By Article 3, both sides engage to assist the respective Consuls in obtaining suitable residences. Clause 4 provides for freedom of trade and residence for Chinese in Tonquin, and trade and residence under the usual conditions for French in the open places in China. By Clause 5, it is agreed that only those persons armed with passports, to be granted by the Chinese, can cross the frontier. In this respect the French in Tonquin are at a disadvantage compared with Europeans residing on the coast, who can go and come freely. The 6th and 7th Articles are the most important in the whole treaty; they are also the longest, but their substance may be given in a few words. Imports across the frontier into China pay one-fifth less than the maritime customs dues, and exports one-third less. Articles not mentioned in the tariff pay 5 per cent. *ad valorem* in each case, and all such goods pay the *likin*, or inland transit dues, in the usual way. On these clauses, which really form the *crux* of the whole treaty, so far as British trade is concerned, two questions arise—What will be the effect of the trade through Tonquin on British trade in southern China? and, should we claim the most-favoured-nation treatment in respect of this reduction of the customs dues? To the first question two of our Consuls in the region affected have already replied that no injury will be done to our trade, for the difficult nature of the country to be crossed between the Red River and the valley of the Si Kiang, or Canton River, has prevented, and will prevent, much trade by this route until the French construct railways to the frontier, and even then the opening of a port on the Canton River will counter-balance the French advantages. As to claiming the favoured-nation treatment, we did not do so in the case of the Russo-Chinese Commercial Treaty of 1881, and M. de Freycinet has intimated an opinion "that the most-favoured-nation treatment applied only to the open ports, and not to the land frontiers of China," a limitation of the favoured-nation clause in which Lord Salisbury did not concur. On the other hand, the Board of Trade recommended that the question should be fought on the ground of principle, which, it said, was all-important. "If stipulations for equal treatment in the matter of duties are to be made to depend on, and to vary with, the cost of transit (the ground on which the reduction of duties was made) there is an end of any certainty or clearness in the meaning of such stipulations." Notwithstanding this strong recommendation, we believe that the Foreign Office has decided not to contest the question at present, and on the whole, perhaps, this is politic. It must be remembered that merchandise from Europe going into China by this route will pay two different Customs dues—the first to the French authorities on entering Tonquin, the second to the Chinese on entering China. Discriminating duties exist, or existed until recently, in Tonquin. General Millot, when Governor, divided all imports into three classes, with different scales of duty—(1) Those of Indo-Chinese origin; (2) those of French origin; (3) those of foreign origin; each class paying higher duties than the preceding one. It will thus be seen that a trifling fifth or third diminution from a 5 per cent. *ad valorem* tariff can do little to help a trade heavily weighted with these discriminating duties from the moment it enters Tonquin. And even if French goods were admitted free into the latter, this reduction, amounting in the one case to 1, in the other to 1½ per cent., would be of little help towards meeting the enormous expense of carriage to Langson, not to speak of all of the distant Laokai. Besides, concluding that the game of fighting the point with France and China was not worth the candle, Lord Rosebery, no doubt, reflected that we shall shortly have the opportunity of claiming similar treatment in the trade across our new frontier in Burmah. When France has completely pacified Tonquin, when she has rendered the Red River navigable, and constructed railways to the frontier, and when she has remodelled the fiscal system of Indo-China so as to admit goods of French origin free of duty, these reduced dues might, if we have been at a standstill all the time, be of some importance; as it is, they do not deserve a second thought from our merchants; they will not have the smallest influence on the trade of either Kwangsi or Yunnan. None the less, however, should every effort be made to secure the opening of another port on the upper course of the Canton River, as has already been suggested by the Hong-Kong Chamber of Commerce, such a port would be very valuable in itself, but its value, or the urgency for it, is not increased a whit because of this treaty. The remaining articles, down to the 14th, are Customs regulations of the ordinary character in such treaties. Article 14 is worthy of notice, inasmuch as it provides for the total prohibition of the trade in opium between Tonquin and China. It is not long since an important French official stated that he looked forward to the day when the major part of the cost of the French administration in Annam and Tonquin would be met by the trade in opium which, he said, was sure to spring up between the two, as the French could grow the poppy in Tonquin and prepare opium to suit the Chinese palate as well as the British in India. The present treaty shatters this dream, as it destroys so many other illusions. Article 15 specifies the goods which are to be contraband; they are those usual in other Chinese treaties. By Article 16, jurisdiction—civil and criminal—is regulated in the usual manner, while the following clause provides for the reciprocal extradition of criminals and deserters. By Article

18 the rules of the maritime customs are to apply to cases not specially provided for in the treaty, and the last article provides for the exchange of ratifications. As will be seen, the instrument gives one small—and at the present moment utterly valueless—concession to France, viz.:—The reduction in import and export dues. But it is none the less the duty of British merchants in the East and at home to seek for new openings in Southern China, and the most obvious of these is the opening of a new port on the Canton River. When the proposal was first made, the late Sir Harry Parkes thought the time unfavourable, for the Franco-Chinese quarrel was then at its height. The same objection does not apply now, and the point is one that may well be mooted in the forthcoming negotiations with reference to trade across our Burmese frontier. The *Times*, from which the above is extracted, says "that the treaty taken by itself is hardly worth a moment's attention, but that when we recollect the hopes it has raised in one country and the fears it has caused amongst British merchants at home and in the East—when we reflect that this is the arrangement which was to destroy British commercial predominance in Southern China and to blast our inheritance in future trade of South-western China—we cannot pass it by without interest or attention."

## Marine Wool.

The manufacture of articles from marine wool, or *bisso*, is an industry carried on, only on a limited scale, on the coast of Sardinia, and more particularly at the island of Madalena; if the product was better known, it might become an important branch of trade, inasmuch as, from the softness of the texture of this substance, its natural colour and durability, *bisso*, instead of its being, as it is now, a simple object of curiosity, merits a place in everyday use. The *bisso*, or golden wool is obtained from the *Pinna nobilis*, a mollusca belonging to a genus of shell fish which attaches itself to rocks and stones at the bottom of the sea by means of a tuft of a fibrous hairy-like substance. This tuft is usually of a yellowish-brown colour, of a silk-like texture, with a brilliant metallic lustre, and is found in great quantities in the numerous little bays and creeks on the coast of Sardinia, and more especially on the shores of the islands of Caprera and La Madalena. The *pinna* is one of the largest bivalves found in the Mediterranean, and the great *pinna* is known at Madalena by the name of *gnacchera*, or *nacchera*; in the Venetian dialect as *gnaccara*, which name is probably derived from the Spanish *nacarra*, signifying a sea shell; whilst the same word in that language, *nacere*, in French signifies mother-of-pearl. *Bisso* appears to have been known to the ancients, as Pliny, in his "Natural History," makes mention of its being found at Taranto, but as being little used. The implement used for collecting this shell fish is simply an oval-shaped ring of strong iron wire, called locally *ferro di nacchera*, which is fixed at the end of a rod from 15 to 20 feet in length, and the *pinna* is disengaged from the rocks and brought up to the surface by this instrument. The fish, which is somewhat indigestible, is used as an article of food by the fishermen, the edible part being well washed and rubbed on a rough surface in order to free it from a bitter tasting substance of a reddish-brown colour which it contains, and called locally *pepe* (pepper). The tuft of the wool is then washed, first in salt water, in order to free it from the sand fragments of shells, and other substances that may be entangled in its fibres, and after a second washing in cold water, it is dried in the sun. When dry it is combed, and the tuft remaining is cut from the root by which it is attached to the shell, and it is next spun like cotton, wool, or other textile substances. The combings also can be spun, but yield an inferior quality of yarn. The *bisso* is of two colours, or rather two shades of the same line particular to it, either dark or light, the latter being the most prized on account of the rich dark gold lustre (*Vielle or*), from which its name "golden wool" is derived. On account of the small quantity in which it is collected, the little care taken in sorting, the stuffs made with this wool are often striped with dark and light shades. Oysters of excellent quality often attach themselves to the shells of the *nacchera*. These shells might be used as an inferior quality of mother-of-pearl. The pearls that are occasionally found in these shells are usually of a light brown or copper colour, sometimes of a reddish tint, and more rarely of a white or rather a dirty white. The price of *bisso* is as follows: When simply-washed and dried, 7 lire per kilog. (2s. 6d. per lb.); combed, 15 lire per kilog. (5s. 7½d. per lb.); and when carded and spun, at 30 lire per kilog. (11s. 3d. per lb.). The cost of spinning is 7.50 lire per kilog. (2s. 7½d.). The fibre losses about 25 per cent. of its weight by combing and spinning. The prices of articles manufactured



from this wool are: Cravats 5 lire each (4s.), small shawls from 25 lire to 30 lire (£1 to £1 4s.); they are extremely durable, and a shawl costing originally 60 lire (£2 8s.), which has been in constant wear in all kinds of weather for upwards of 12 years, was lately seen by the writer.—*Journal of the Society of Arts.*

### British Interests and the Sultan of Johore.

His Highness, the Sultan of Johore, who has spent a considerable time in England on this, his second visit to our country, has recently returned, after having, it is understood, afforded considerable facilities to British commerce and its protection in the Pacific. Lord Granville has scored a diplomatic success in securing from the Sultan an additional coaling-station for British men-of-war in the neighbourhood of the famous Straits of Malacca. During his stay, the Sultan has been several times the guest of her Majesty the Queen, and was present at the State ball given at Buckingham Palace recently, when the magnificence of the diamonds worn by himself and *suite* attracted considerable comment and attention, as they have done on many other public occasions. It may be remembered that it was the Sultan's father who ceded the valuable port of Singapore to Great Britain. His Highness, the present Sultan, has now been prevailed upon by representations from influential quarters, during his visit, to concede to British capital and enterprise the development of the well-known mineral wealth and other valuable resources of his country. The Johore Tin Streaming Company have already begun work with wonderful results, and another fortunate syndicate have, so far, declined the most tempting proposals to share their good luck with others, having obtained from his Highness the mining rights of Mount Ophir and the surrounding district—some of the wealthiest undeveloped gold fields in the world. It is clear, however, that the rich promise of this almost virgin territory cannot long remain in the hands of a fortunate few, and that, in the long run, a remunerative outlet will be found for British industry and enterprise.

### Irish Industries.

The proposal of Lady Aberdeen to bring under one management the local industries in Ireland, which have hitherto been working independently of each other, has, since our last issue, been amplified by her ladyship, who now offers the gracious prospectus of a scheme for the full employment of Ireland's waste energies, and the hope of prosperous employment to alleviate misery and allay discontent. It is not possible to find the counterpart of the popularity enjoyed by the late Viceroy and his wife. When they left Dublin, the principal establishments put up shutters to allow their assistants the opportunity of sharing in the ovation accorded to them on all hands. But, if Lady Aberdeen has only found a workable plan for making Ireland busy and happy, she will have won the gratitude of two nations. For the present, we can do no more than give the bare outlines of the proposed association. This is to have a membership independent of birth or creed, the conditions of joining are these:—That every member of the association should take every opportunity of encouraging the use of Irish manufactures of all descriptions. That each should promote, as far as possible, the improvement and development of existing Irish industries, and should introduce others that may be found suitable. That each should collect all available information concerning cottage industries in this and other countries, and the methods of working them, and should strive to spread this knowledge amongst the people. That all such efforts as may be made shall be carried out on strictly commercial principles. From the members will be formed local committees to supervise the work in their several districts. These would be guided by, and correspond with, inspectors, of whom one is to be appointed to each of the four provinces, and the inspectors would report to a central council in Dublin, composed of representative men and women, and the objects of this council would be:—To collect information regarding cottage industries carried on in all countries, concerning market fashions, improved appliances, etc. To buy implements and materials, for the local branches, on wholesale

terms. To make contracts, and to find a market for the goods. To arrange with the railway companies as to rates of carriage. To advise generally in the establishment and development of local branches, and to prevent unmarketable goods being manufactured. To administer the funds. The industries to be kept in view as most promising would be hand-sewn linens, hosiery, homespun woollens, lacemaking, embroidery, and glove making, with some agricultural pursuits; and the purely commercial character of the proposals, which we believe to be their most hopeful feature, are to be carried out by the establishment of a warehouse in Dublin, the appointment of a business manager, and employment of travellers and agents wherever necessary. Preliminary to this business of inspection and distribution, there must be the industrial education of workers, but this is expected to require public support, either by direct contributions, or by the grant of result fees for proficiency, such as are already given for other branches of education.



A cheap mode of rendering fabrics unflammable is four parts of borax and three parts sulphate of magnesia, shaken up together just before being required. The mixture is then dissolved in from twenty to thirty parts of warm water. Into the resulting solution the articles to be protected from fire are immersed, and when they are thoroughly soaked they are wrung out and dried.

The *Novoe Vremya*, at the end of an article on the cultivation of cotton in Russia, expresses the opinion that its successful expansion in Central Asia would enable Russian manufacturers to flood the markets of Asia, and render English competition impossible. For this desirable result, it says only the energetic co-operation of those interested and a certain amount of protection on the part of the Government are necessary.

A convention has been signed at Peking arranging for the continuation of the decennial missions from Burmah, China agreeing to British rule in Burmah, and promising to encourage trade, which will be regulated by a special convention. There will also be a commission for delimitating the frontier. The Thibet mission is to be countermanded on account of local difficulties apprehended by the Chinese Government, who on their part engage to take steps to promote trade between India and Thibet.

News from Melbourne states that the Wool Growers' Association of Australasia have conferred with leading Hong Kong merchants as to starting factories in China for the manufacture of blankets and other woollen goods, and that definite proposals will, in all probability, be shortly made to carry out the project through the medium of a limited company. Information is being sought in London before a decision is arrived at, and meanwhile inquiries as to possibilities in Japan are also being made.

The war of tariffs between France and Italy has commenced since the rejection of the treaty of navigation by the French Chamber of Deputies. The old treaty having expired on the 15th July, and the Italian Government having refused to renew the provisional arrangement, French shipping became subject to the general tariff or double duties in Italian ports. The French Government has responded by a decree imposing differential duties of *rf.* 50c. per ton on Italian steamers arriving in French ports from ports in the Mediterranean, and *rf.* from other ports. Steamers that have already touched in a French port must pay *2f.* per ton, the intention being to exclude Italian ships from the coasting trade. For sailing ships of more than 100 tons the dues are respectively *70c.*, *rf.* 10c., and *rf.* 20c., and for ships of less than 100 tons *50c.* for ports in the Mediterranean, and *rf.* for ships that have touched at a French port. These charges are all in addition to the ordinary port dues.

The annual reports of the German Chamber of Commerce unanimously confirm a fall in prices in nearly all departments of economic life. The Magdeburg report has a few words on the subject which are worth quoting:—"We live in an age when, more than ever before, everything tends to facilitate trade. Improved means of communication, surmounting difficulties which formerly were insuperable, help to increase the exchange of products, so that goods can now be forwarded far from the centre of production to places where, in former times, it was impossible to possess them. This circumstance of improved modes of communication has helped to bring prices down, while another factor is the technical progress made in the manufacture of all articles. The cost of production and supply of most goods has become much less during the last fifty years, and the vast means of intercourse have incalculably widened the field of competition." There is no doubt that the above considerations offer a cue to the great change which has come over commerce of late years. But whatever causes besides have contributed to reduce prices, the severe competition which now rules trade has played a large part in producing this result.



### Receiving Orders.

Atherton, Ann, Margaret Caldwell, James Atherton, Sarah Anne Morant, Joseph Atherton, and G. Atherton (trading as W. and J. Atherton), Albert Mill, Albert Street, Horwich, Lancashire, cotton spinners.  
 Milnes, B. (trading as B. Milnes and Company), Bradford Road, Batley, Yorkshire, woollen manufacturer.  
 Sackville, J. W. formerly Castle Terrace, Seedley, now 133, Church Street, Pendleton, Salford, calico printer.

### Adjudications of Bankruptcy.

Milnes, B. (trading as B. Milnes and Company) Bradford Road, Batley, Yorkshire, woollen manufacturer.  
 Swanwick, P., 41, High Pavement, Nottingham, lace manufacturer.  
 Sackville, J. W. formerly Castle Terrace, Seedley, now 133, Church Street, Pendleton, Salford, calico printer.

### Dividends.

Bower, H., Millhouse, Thurlstone, near Penistone, woollen cloth manufacturer, ss. rd. (first and final), Official Receiver's Office, 3, Eastgate, Barnsley.  
 Marriott, F., Bradford Road, Birstall, Yorkshire, woollen manufacturer, 11s., Armitage, Clough and Co., 23, John William Street, Huddersfield.  
 Walker, C., 4, Guildford Street, Leeds, Yorkshire, woollen merchant, 6s. 8d., Office of the Trustee, 1, Bond Street, Leeds.  
 Williams, L. E., Norton Villa, Lampeter Velfrey, Pembrokeshire, weaver and woollen manufacturer, 1s. 6d., Official Receiver's Office, 11, Quay Street, Carmarthen.

### Dissolutions of Partnership.

Barker, J., T. Cockshott, and D. McL. Brown, Bradford, Yorkshire, stuff merchants.  
 Biddlecombe, T. E., and A. Allen, Gun Alley, Bermondsey Street, Southwark, wool and skin rug manufacturers.  
 Barton, G. and T. Barton, Macclesfield, Cheshire, silk manufacturers.  
 Dearnley, J., and W. H. Horsfall, Manchester, yarn and cotton commission and insurance agents.  
 Heyworth, E., and W. Smaley, Manchester, cloth and commission agents.  
 Kay, R. H., and W. Chorlton, Moss Brook Mills, Audenshaw, Lancashire, manufacturers and spinners.  
 Marriott, H. R., P. H. Marriott, and L. H. Marriott, Manchester, manufacturers and merchants.  
 Priestley, B., and G. Peel, Kiln End Mills, Elland, Yorkshire, woollen manufacturers.  
 Smith, W., E. Smith, A. Smith, and J. I. Mortimer, Huddersfield, woollen cloth manufacturers.

### PATENTS.

#### Applications for Letters Patent.

Automatic weighing machines. J. Hart and J. L. Samson, London.	2nd July	8,703
Automatic boiler cleaners. H. Sims, London.	7th July	8,899
Apparatus applied to carpet and other looms for cutting the pile in any required pattern. H. J. Haddon, London.	21st July	9,482
A lifting rake for machines for washing wool, &c. A. Deletombe and A. Prouvost, London.	26th July	9,635
Belt fasteners. J. Whitehead, Newcastle-upon-Tyne.	29th June	8,514
Bobbin carriers of drum winding machines for yarns or threads. R. Broadbent, Manchester.	12th July	9,045
Belt stretching machinery. F. Reddaway, Manchester.	13th July	9,106
Bobbins. Bouvet Brothers, London.	14th July	9,183
Belts and straps applicable as driving belts for machinery and other uses. R. Cheetham and D. B. Myers, London.	27th July	9,689
Connecting jacquard cards or sewing parallel rows on fabrics simultaneously. A. Anderson and R. A. F. Pollock, Glasgow.	6th July	8,816
Coating textile fabrics, &c., with wax. H. H. Lake, London.	6th July	8,853
Construction of spinning and doubling frames. E. Hird, London.	14th July	9,160
Cutting motion of looms for double pile fabrics. W. Smith, Halifax.	20th July	9,386
Cap and ring spinning and twisting frames. W. T. Garnett, Bradford.	22nd July	9,491
Carding engines. J. M. Hetherington, Manchester.	24th July	9,579
Chemical fire-extinguishers. J. H. and J. W. Galloway, London.	26th July	9,620

Compound high and low pressure double-acting gas governor. W. Pottor, London.	27th July	9,676
Clipping lace and other fabrics. J. H. Johnson, London.	29th July	9,803
Detergents and dyes. C. P. Andersen, London.	29th June	8,528
Driving belt. R. Binnall, Rochdale.	3rd July	8,715
Driving belt. A. J. Boulton, London.	12th July	9,062
Dyeing cotton in the sliver for the purpose of producing coloured yarn. G. E. Sutcliffe, Halifax.	26th July	9,611
Dyeing slivers of woollen, worsted, alpaca, and mohair, for making coloured yarns. E. and G. E. Sutcliffe, Halifax.	29th July	9,776
Dyeing slivers of silk for making coloured yarns. E. and G. E. Sutcliffe, Halifax.	29th July	9,777
Fire extinguishing apparatus. W. M. Glenister, Hastings.	1st July	8,619
Feeding apparatus for scutching or fibre cleaning. A. H. Death, London.	2nd July	8,706
Fastener for machine bands. H. P. Trueman, Birmingham.	5th July	8,753
Finishing woollen and other woven and felted fabrics. G. H. Nussey and W. B. Leachman, London.	13th July	9,128
Friction pulleys. J. Dean, J. Smith, and J. Graze, Bradford.	15th July	9,203
Fasteners for machine belts. H. Jewson, Norwich.	16th July	9,232
Fancy yarns. J. F. Rouse, Bradford.	17th July	9,292
Fastening the pile to the grounds or backs when weaving pile fabrics double. E. Websky, C. F. and B. Hartmann and C. Wilson, London.	27th July	9,671
Heating steam boiler and other furnaces by ground coal or coal dust, and also for consuming smoke. S. Smithson, Bradford.	29th July	9,785
Improved lace fabrics. J. H. Johnson, London.	23rd July	9,564
Joining endless belts of leather employed on gill boxes, combing and preparing machines, and belting for driving or transmitting power. T. Wheelhouse, Halifax.	29th July	9,773
Looms for pile fabrics. J. Wade, London.	5th July	8,771
Lubricators. F. Trier, London.	5th July	8,777
Looms. H. H. Lake, London.	6th July	8,855
Loose reed and warp letting-off motions. C. and S. Catlow, Halifax.	24th July	9,574
Lace machines. J. Jardine, London.	26th July	9,641
Lubricating gas engines. A. Bradshaw, Halifax.	27th July	9,660
Materials for neckties, scarfs, &c. J. Frankel and L. Fisher, London.	29th June	8,521
Manufacture and ornamentation of woven fabrics. J. Platt, Manchester.	10th July	9,002
Oil-cans. T. Caldwell, London.	3rd July	8,729
Openers and Scutchers. J. W. Makant and P. Parkinson, London.	5th July	8,766
Operating the marking appliances of machines for sizing yarns. L. Wilkinson and E. Morris, Halifax.	10th July	9,007
Operating the heads of looms. W. Hargreaves, Halifax.	10th July	9,011
Operating the shedding motion and the picking motion of looms. F. Leeming Halifax.	17th July	9,295
Operating shafts or gears in looms. W. Irving, Millbridge, and F. Howarth, Hightown.	17th July	9,297
Printing or colouring of yarns for woven fabrics. L. M. Lardiére, London.	7th July	8,903
Regulating flats in carding engines. T. Duncan, Oldham.	12th July	9,044
Reeling or winding silk. L. Camel, London.	19th July	9,363
Stentering, drying and finishing machinery. A. C. Adam, Glasgow.	2nd July	8,661
Shedding motion of looms. W. Thompson and F. W. Jepson, Halifax.	9th July	8,952
Shuttle apparatus for looms. E. Dixon and T. Coulthard, London.	9th July	8,996
Suction apparatus for withdrawing thread ends from weaving shuttles. H. Gardner, London.	12th July	9,096
Shuttle boxes for looms. J. Hollingworth, Huddersfield.	15th July	9,200
Traversed warp machine. W. Tatham and J. Hancock, London.	3rd July	8,732
Throwing silk. Leon Camel, London.	20th July	9,429
Weavers' shuttles. J. Waddington, Bradford.	30th June	8,557
Wet spinning frames. J. Erskine and F. W. Finlay, Belfast.	8th July	8,914
Weaving shuttles. J. Campbell, Glasgow.	16th July	9,242
Weaving fabrics of irregular thickness. J. Schofield and S. Hill, Manchester.	19th July	9,338
Weavers' shuttle tongues. J. Waddington, Bradford.	23rd July	9,525

#### Patents Sealed.

7,797	7,934	1,121	4,043	7,986	8,024	4,017	7,723
10,183	4,474	8,150	8,682	8,684	2,934	4,488	5,818
7,669	8,335	44,78	6,283	6,379	7,661	8,402	14,722
4,894	8,500	8,993	4,506	4,927	5,106	6,518	8,166
8,200	8,665	8,794	8,878	9,254	9,428	10,466	15,075
2,743	6,941	7,784	9,690	10,013	12,054	4,323	4,759



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## Irish Agriculture in 1885—Flax Cultivation.



THE most interesting figures of the official report on Irish agriculture in 1885, are undoubtedly those which refer to the cultivation of flax, which, so far as Ireland is concerned, appears to have taken a turn for the better, and is now being talked of, along with the growing of tobacco, as a future industry of a remunerative nature. The area of land under flax in Ireland in 1885 had increased by nearly 1900 acres, as compared with the flax area of the preceding year, but although that indicates a hopeful reaction, the figures of either year are far below those of the years 1869-70, when the areas under flax were 229,178 and 194,893 acres respectively. During the last six years, the figures of cultivation have been as follows:—

Acres.	Acres.
1880 157,534	1883 95,943
1881 147,085	1884 89,225
1882 113,484	1885 108,147

whilst the average of ten years was 120,747 acres. With regard to the ratio of production, it has ranged from 35,670

tons, to 21,356 tons in 1885. The figures in the official report being somewhat bald, we are enabled to supplement the information they convey from other sources. The great Irish flax producing province, as may readily be supposed, is Ulster, the seat of the Irish linen industry. The area sown with flax in that province in 1885 extended to 106,659 acres, leaving only 1488 acres to be cultivated in the other three provinces of Ireland—taken together the four provinces supply about one-fifth of the flax required in the United Kingdom. As regards the future, it is expected—the fact, however, is not yet known—that a still larger area has been sown in the present year. At all events, whether the acreage be increased or no, the ratio of production has been increased, the number of stones obtained per acre being considerably above the preceding year. In Ulster, the figures, taking them roundly, are 25 stones to the acre in 1884, and 30 stones in 1885. In one or two counties, the increase ranges from 46 to 54 per cent. The importance of the flax cultivation in Ireland can be deduced from the following statement, contained in the eighteenth report of the Flax supply Association:—"There is in Ulster alone a larger number of spindles using flax fibre than there is in any other two countries in Europe, and about one-fifth only of the flax consumed is grown at home, the other four-fifths coming from abroad, with all the disadvantages of carriage and other charges added to the cost of production." In the face of the fact that the flax area has increased, and is supposed to be increasing, the number of scutching mills in Ireland has decreased, and is still decreasing—from 1542 in 1868, the number has now fallen to 1103, of which 1075 are in the province of Ulster. In Great Britain, flax as an agricultural crop seems at the present time to be of little account, only 2490 acres being under cultivation, of which Scotland can only claim 41, the remainder being in England and Wales. At one time, the cultivation of flax in Great Britain was an occupation of some account; in the year 1870, 22,354 acres were sown in England, whilst in Scotland, in the same year, the flax area was set down as 1399 acres. These figures had fallen in 1877 to 7210 and 243 acres respectively, and at one period, in Scotland, premiums were paid for its cultivation—as, indeed, was the case in the sister country up to 1871, the grants being made from the Imperial Exchequer. Seeing, then, that the cultivation of this important product of the soil was at one time an enterprise of some magnitude in Great Britain, it becomes interesting to know how it is again to be made profitable, accepting the decay of the industry as a proof that it did not pay, or, at any rate, that other agricultural crops were for the time being more worthy of attention. Now that agriculture in the United Kingdom is so far under a cloud, chiefly arising from the enormous foreign competition which has set in against our home farmers, it seems to be thought that flax cultivation ought again to be resorted to. If so, those who enter on such a speculation must bear in mind that foreign competition will have to be encountered in flax, as well as in flour and beef. France sows a large area, as also do Germany and Belgium, likewise Italy and Russia, which, as many people are aware, is an enormous flax growing country. The most recent figures of the flax growing areas of these countries are as follow:—

Russia .....	3,776,288 acres in 1881
Germany .....	268,744 " 1883
Austria .....	211,721 " 1885
Italy .....	153,968 " 1883
France .....	180,577 " 1884
Belgium .....	99,368 " 1883

Holland, Hungary, and Sweden also cultivate considerable areas, and as to the values of the materials produced, it is interesting to know that Ireland maintains an excellent position, above the average, indeed, of all the foreign flax. In the matter of price, Belgian flax still stands at the head of the quotations, the Courtrai being about the best that comes to market, alike for strength and colour. Prices in 1884 were as follow:—Belgian, £74 per ton; Dutch, £65; French, £48; Russian, £32; German, £32; Irish, £56, or 7s. per stone. The figures appertaining to foreign flax culture might be much extended, but, for the present, we have no intention of going beyond the boundary of the figures laid down in recent reports. It is only right, however, that we should state that the number of persons employed in connection with the Irish flax industries in the year 1885 was, of all ages, 61,749. And it may



also be as well to state here that at a farther back period than any we have referred to—namely, in 1864—the area of flax under cultivation in Ireland was over three hundred thousand acres. We shall be able to recur to a consideration of this industry when I learn something of the plans which are now being matured for the revival of the industry on the agricultural lands of Great Britain. The following sentences spoken on a recent occasion are worthy of attention:—"It appears to me in the future that those countries, which produce flax in the largest quantities proportionate to their requirements, and prepare the fibre in the most economical way, will in the manufacture of the great bulk of linen fabrics have a great advantage over those linen-producing countries which are compelled to import a large proportion of their requirements in raw material, and that these latter will find themselves unable to stem the competition of the former." In other words, grow your own flax and weave your own linen.

In connection with this industry, a meeting of gentlemen interested in the growing of flax was held a few days ago in London, to discuss the general adoption of the industry, as a remedy for the universal depression, which at present weighs so heavily upon the farming interest. Mr. Thomas Briggs, manufacturer, and a practical flax grower, presided, and the discussion took place on a paper read by Mr. T. L. Henley, late of the United States. The paper introduced the subject by calling attention to the five millions sterling paid yearly for flax seed, and the million pounds paid for imported linseed oil and linseed cake. All this produce could be grown in England, and the preparation of the fibre could be carried on by any ordinary farm labourer, after a few hours' teaching. Hitherto, the objections have been (1), a want of enterprise; (2) old leases prohibiting flax growing; (3), the business had to be learnt by the farmer, who preferred to grow crops he understood. Mr. Henley exhibited a model of a machine he has invented for steeping flax straw, and produced samples of the work of the new flax-scutching machine, made by a Belfast firm. This, the inventor claims, can be worked by any farm labourer after half-an-hour's teaching.—A discussion on the question, which was opened by the Chairman, then took place. Eventually a memorial to Lord Salisbury, praying him to receive a deputation from the meeting, and asking that a small proportion of the two millions granted for the development of profitable industries in Ireland might be appropriated for establishing flax works in the south of Ireland was unanimously adopted by the meeting.

### In International Exhibition in Spain.

The year 1887 will be as busy in the matter of exhibitions as the present year. The American enterprise is to open in London, a grand display is intended to be on view in Manchester, Newcastle has come forward in a vigorous manner with a scheme for a similar show, and Birmingham does not intend to be behind others in the race. We have no doubt that the English Exhibitions will find numerous exhibitors, but for those merchants and manufacturers who intend taking advantage of the new Convention with Spain, by extending their trade connection with that country, a favourable opportunity for attaining their object will be afforded by an International Exhibition which is projected to take place at Barcelona next year. The Exhibition has received the approval of the Government and of an influential Patronage Commission; and will comprise exhibits of agricultural, industrial, and commercial products, with a special section for marine, fine arts, electricity, medicine and hydropathy. International congresses are proposed for mercantile and other objects. The park and adjacent grounds belonging to the Municipality of Barcelona will be utilised for the purposes of the Exhibition, they being conveniently situated near the railway lines and close to the new quay of the port. Besides the principal Palace of Industry and the pavilion destined for machinery, there will be erected, in the Exhibition grounds, additional buildings intended to contain the shrubs, plants, and other objects excluded from the principal halls. A total area of 300,000 metres will be occupied. The exhibition will be opened on the 15th September, 1887, lasting at least six months, with an extension of two months if found desirable. Foreign countries are to be represented by commissioners, through whom exhibitors must transact their business with the Executive Committee. The Spanish Government will adopt the necessary measures in order to protect in Spain those inventions capable of being patented, the drawings and models as well as the industrial trade marks of goods represented at the Exhibition. Applications for space and other information may be addressed to the secretary of the Executive Committee of the International Exhibition (Sr. D. Eugenio R. Serrano de Casanova) at Barcelona.

### Foreign Trade Reports by Her Majesty's Consuls.



THE report by Acting Consul-General Eyres on the trade and commerce of Beyrout, for the year 1885, has been published by the Foreign Office. The Consul says:—"Trade in Beyrout has, during the last two years (1884-5), steadily increased in volume. This is due to the fact that there has been an enormous growth of population—the causes of which need not to be here set down—and, consequently, Beyrout yearly becomes a commercial centre of greater importance, which usurps and draws to itself a great proportion of the trade of those towns which were formerly bases of supply in Syria. By far the most important among the imports from Great Britain is Manchester goods, which include grey T cloth, grey and white shirting, water twist, coloured yarn, Turkey reds, prints, and handkerchiefs. The amount of imports of Manchester goods has steadily advanced year by year, and this advance is more than proportionate to the growth of the population. English manufacturers, therefore, in this class of goods, not only hold their own in the Beyrout market in spite of German competition, but also make perceptible progress. There is an increase of £72,800 in the year 1885 under this heading. Woollens, however, are now almost entirely imported from Germany, the quantity arriving from England being insignificant. The reason is that German woollens are as cheap and are better coloured, and the patterns are more varied and tasteful. Cloth and coloured yarns are also brought from Germany and Switzerland, but the total trade of these two countries in this class of goods does not amount to more than 10 per cent. of the imports from Manchester and Glasgow. The output of silk is yearly on the increase, owing to the substitution of French for Japanese eggs, and the silk is of a higher quality, and, therefore, more valuable. In 1884, the silk harvest amounted to 5,000,000 lbs. of cocoons, and in 1885 to 5,500,000 lbs. of cocoons, of which a very small amount is spun into coarse silk, and made up in the country, and the rest is sent to France. Under an energetic man of business, the receipts of the Custom House have, during the last year and a half, doubled in amount, but, in spite of the augmentation of revenue, the same complaints against damage done to goods, negligence, bad housing, and want of room are heard as of old. Hitherto no efforts have been made to ameliorate the condition of affairs, though now it has become a pressing necessity that larger buildings should be constructed, inasmuch as the Custom House is very much the same size as it was when the commerce of Beyrout was less by 75 per cent. than it is now. Steamers have frequently to wait two or three days before they can discharge, and then only are able to land their goods on an open quay. Promises of redress are not wanting on the part of the authorities at Constantinople that the improvements will be carried out, but in the meantime nothing is done, and the loss incurred by merchants, and the damage to the public revenue, is incalculable. It is worthy of note, that while trade is increasing with rapid strides, while the population is growing fast, while houses and business premises are springing up on every side, and each year fresh tracts of land are brought under cultivation, in presence of all these outward signs of prosperity, the universal complaint is that trade is so bad that it is difficult to obtain a livelihood thereby. This apparently contradictory state of things is due, I believe, principally to excessive competition and a loose system of credit. Competition, again, is so severe that profits are reduced to a minimum. No sooner does a native find himself possessed of a small capital than he at once opens a shop, and, in haste to make a fortune, proceeds to undersell his neighbours. Consequently, trade, which, if confined within reasonable limits, would be productive of fair profits, is ruined by too eager competition.

A SUGGESTION FOR CHAMBERS OF COMMERCE.—Consul Brennan, writing from Tientsin, says:—"Cotton yarn is making its way into the market very rapidly. Cotton yarn appears for the first time in the trade returns of 1879. Since then the figures have been:—

Date.	Piculs of 133½ lb.
1879 .....	872
1880 .....	333
1881 .....	1,610
1882 .....	4,487
1883 .....	8,002
1884 .....	11,671
1885 .....	35,157

The yarn is principally of Bombay manufacture, and is of the kind known in the trade as 16's and 20's. In my reply to the queries of the Royal Commission on the Depression of Trade, I pointed out that the consumption of British articles would increase if manufacturers were better informed of the wants of the Chinese. The information cannot be supplied by consuls. The research must be made by persons with technical knowledge. I instanced the growing demand for cotton yarn. Instead of selling cotton yarn to the Chinese, could we not find out what they make with it, and sell them the ready-



made article? Again, among the imports from foreign countries last year there were 7,067,000 lbs. of old iron. A considerable portion of this consisted of old horseshoes. I am told that these are converted into knives and tools. An expert could at a glance say whether these knives and tools could be made cheaper by our manufacturers. The most ordinary pair of English scissors is a piece of finished workmanship by the side of the best Chinese scissors, but Chinese will not use ours because they are not of the right shape. They like scissors with handles into which they can thrust the whole thumb and forefingers. An intelligent delegate from the Sheffield Chamber of Commerce could make a more valuable report on this head than all the English consuls in China. I would recommend Manchester, Birmingham and Sheffield, to consider this suggestion. Their agents would receive every assistance at the hands of her Majesty's consuls. Like me, they doubtless all regret not being able to say what information may be useful and what may be superfluous. A new comer observes many things which an old resident sees without noticing, and an expert has the further advantage that, when something attracts his attention, he can tell at a glance whether there is money in it.

AUSTRIA.—The English Consul at Vienna, reporting on the trade of Austria-Hungary for the last year, says:—"A few words as to the cotton printing factories in Austria will show with what difficulties Austrian export has to contend, and why the Austrian manufacturer has such protectionist sympathies, and uses such pressure on his Government to secure the domestic market." Dr. Peez, an economical authority, writes to the following effect in a commercial journal:—"The foreign and the domestic trade in cotton prints are very diverse. The first requires specialisation, and necessitates the whole energy of the manufacturer being set in one direction. To retain the domestic market, on the contrary, all tastes must be consulted—those of rich and poor, of town and country; those of altering fashion, as well as those of national type. In order to secure the local retail merchants, the manufacturers must supply them with every possible description of goods. In addition to these multifarious requirements of the domestic market, its extent is a limited one. A Mulhouse trader, for instance (when his connection with Paris was a closer one), could prepare, say, 100 pieces of some finer goods, and sell 30 in Paris, 20 in St. Petersburg, 10 in London, 10 in Cuba, five in Vienna, and the rest elsewhere. The Austrian manufacturer, on the other hand, cannot dictate the fashion, and can only find a sure market for the five pieces for which he can find a sale in Vienna. These five pieces he cannot consequently supply as cheaply as Mulhouse which produces 100, for he must employ just as costly pattern artists, dyeing chemists, trained workmen, and machines. Thus he ends by devoting his attention to the domestic market, because it is a permanent and secure one, and independent of all crises. In the world's markets, he is exposed to a constant struggle, in which the weakest goes to the wall, and even those weaker than himself, can, by Custom's measures, deprive him of their markets."

ROUEN.—Consul William, in his report of the trade of Rouen, states that "hard times" has been the universal cry of the cotton manufacturers. For this depression, various causes have been assigned, such as foreign competition, and the gradual loss of the trade of the Colonies, resulting from the tariff regulations, which do not discriminate sufficiently in favour of France, and the distress prevailing among agriculturists, owing to a succession of unfavourable seasons and other conditions. While these have largely contributed to the stagnation in business, other causes of a still more vital nature threaten to perpetuate this state of affairs. Spinning, until the last few months, seemed to have an advantage over weaving, owing to the low price of stock; but this has increased gradually, and only a few of the best equipped factories can successfully compete with English and Swiss yarns, which it is greatly feared will take possession of their market. The temporary admission of yarns below No. 50, so strenuously advocated by the silk weavers and others at Lyons, is equally strenuously opposed in my district, and it is claimed that it will ruin spinners. Weaving has been greatly affected by the advance in wool.

BOMBAY YARNS SUPPLANTING ENGLISH YARNS IN JAPAN.—Consul Troup reports from Hiogo:—"Bombay yarns appear to be supplanting English-made yarns in the consumption of the district. Deliveries of English yarns have decreased from 4,198,300lbs. in 1884 to 2,338,800lbs. in 1885, while deliveries of Bombays have, on the contrary, increased from 6,792,400lbs. in the former year to 8,537,200lbs. last year. This can partly be accounted for by the improved spinnings coming forward from Bombay taking the place of some of the English yarns, which are more expensive. Bombay yarns having to be paid for in silver, while English spinnings have to be paid for in gold, the former have doubtless received an impetus from the relative decline in the value of silver. It is also stated that the softer spun Bombays are coming more into favour with the Japanese consumer than the harder spun English yarns. Deliveries of grey shirtings have increased by 77,000 pieces over those for the previous year, the total for last year being reckoned at 233,312 pieces. I am unable to account for this unless it implies a transfer to the above extent of the direct trade in this article from Yokohama to this port. White shirtings, cotton velvets, and some other articles show an improvement. Victoria lawns and some other English cottons, under the head of fancy articles, have experienced depression. The demand for most kinds of woollen articles fell off to some extent last year. Under the heading of Italian cloth, however, there has been an increase in deliveries which nearly counterbalanced the falling off in other English woollens."

RHEIMS.—In presenting his report of the trade in this district, Consul Frisbie says:—"As many of the looms of Rheims are only calculated for weaving the finest dress goods, it is necessary for the manufacturers to wait, with what patience they may be able to command, the time when their goods shall be generally worn, for a resumption of more active, prosperous business. Under the present condition of things, one of the largest woollen manufacturing firms of Rheims considered itself compelled to reduce the wages of its employees 20 per cent. and three other important firms, in the same manufacturing line, followed in making a sweeping reduction of 10 per cent. in the wages of all their employees, and it is said that other firms will soon follow in a like reduction of the wages of labour. The employees of the firms, who have so largely reduced their wages in each case, went out on a strike for a few days against the reduction, and then resumed their work again, finding nothing better to do. It is no exaggeration to say that the condition of labour at Rheims is very bad, and that there is no immediate prospect for its becoming better, and the same is true of commercial affairs."

### Oils on Metals.

One of the natural results of depression in trade is the desire to economise. In prosperous times, losses arise from many causes, among them the corrosion of vessels in which oils are kept and transported, and of the surfaces of bearings and journals. In some mills, and not many years ago, the same lubricant was used for the shaft of the engine, and for the spindle of the bobbin. Now all this is changed. Everybody recognizes the necessity of adapting the oil exactly to its work; of using great care in the selection of oil for light and multiplied bearings, where, as in the case of spindles, an increase of friction, almost imperceptible in one, becomes so magnified by the number as to be a serious impediment to successful working, and a heavy tax upon the motive power. Perhaps the makers of mechanical oil-testing machines have, in some cases, assumed too much. Such machines give an idea of the viscosity of the oil, but it is a fatal error to assume that the oil which shows the least friction with a small testing machine, will also work with little friction on a piece of heavy machinery, or *vice versa*. We have good authority—I. J. Redwood—for saying that "the lubricant must have such viscosity as to keep the moving surfaces apart at the maximum pressure;" to which another excellent authority, J. J. Coleman, adds: "any increase of viscosity will augment the friction, and any decrease will also augment friction, the former resulting from friction among the particles of the lubricant, the latter from the metallic surfaces approximating too closely. Hence it follows that the suitability of an oil for a particular class of machinery, can be determined only by trying it upon journals or bearings of the same size, and subject to the same pressure as that of the machine itself. Once determine this point by experiment, and find that a particular viscosity is suitable for the work, and instruments, such as the pipette, can be used to adjust fresh supplies exactly to the viscosity of the sample known to succeed on the machinery." As to the oil which is to be used as a standard, the author last named thinks that rape oil will perhaps maintain a preference. He regards it as the most extensively used and important of vegetable lubricants, but admits that it has not, as found in commerce, a constantly uniform viscosity and specific gravity. Water being taken at 1000, the relative weights of samples were found to vary from 912 to 916. Such oils are sometimes called colza. A more accurate standard might be found in the oil of sweet almonds, which is almost pure oleine, and is of all oils the most constant in quality.

CORRODING ACTION OF OILS.—Before the publication, in June of this year, of the results of Mr. Redwood's experiments, little was positively known of the extent to which even the common metals are corroded by oils. The corrosive action of hydrocarbons was attributed to impurities, such as water and slight traces of phenols and bases, which most commercial paraffin oil contains, on account of the difficulty of entirely removing them. In the experiments, portions of metals in ordinary use were employed. These, after being thoroughly cleaned, washed with ether and dried, were placed in corked tubes with 15 cub. cent. of the oil. These tubes were kept for twelve months, at an average temperature of about 80° F. in summer, and at from 50° to 55° F. in winter. The tallow oil was, of course, solid during a portion of the time. After the lapse of the twelve months, the oils were poured off from the metals, which, after being washed with ether, were dried and weighed. Nine different oils were tried, viz.:—mineral lubricating, olive, rape, lard oil, tallow oil, cotton seed oil, sperm, whale and seal. Iron was least affected by seal oil, and most by tallow oil. Brass is not affected by rape oil, least by olive oil, and most by cotton seed oil. Lead is least affected by olive oil, and most by whale oil; whale, sperm and lard oils all act to very nearly the same extent on lead. Zinc seems to be not acted on by mineral lubricating oil, least by lard oil, and most by sperm oil. Copper is not affected by mineral lubricating oil, least by sperm oil, and most by tallow oil. Another table shows that mineral lubricating oil has no action on zinc and copper, acts least on brass, and most on lead. Olive oil acts least on tin, and most on copper. Rape oil has no action on brass and tin, acts least on iron, and most on copper. Tallow oil acts least on tin, and most on copper. Lard oil acts least on zinc, and most on copper. Cotton seed oil acts least on lead, and most on tin. Sperm oil acts least



on brass, and most on zinc. Whale oil has no action on tin, acts least on brass, and most on lead. Seal oil acts least on brass, and most on copper. The chemical examination of the oils appears to afford the most trustworthy guide in determining what metal is the best for the construction of storage tanks for the different oils. In some cases where the percentage loss of metal, arising from the formation of a deposit not taken up by the oil, was large, only a trace of the metal was found in the oil. Some of the oils have both a dissolving and a depositing effect, others have only one or the other. There is no reason to suppose that lubricating oils dissipate themselves in vapour or gas.—*American Textile Record*.

### German and Austrian Export Agencies.

There is, says the *Yorkshire Post*, a fundamental difference between the export agency and the commercial museum. The object of the latter is to inform the merchant and manufacturer of the needs and resources of foreign markets. The export agency, on the other hand, pursues an object more directly practical. It undertakes to furnish the foreign buyer with information regarding the resources of native industry, to place before him samples of the staple manufactures and natural products, and to enable him to give his orders without the expensive and time-occupying necessity of travelling from one town to another, and he is even saved the trouble of visiting a series of factories. Since the primary object of the export agency is to create the largest possible volume of business, it supplies all necessary information free of charge; and the expenses are defrayed by the rents paid by manufacturers for space in which to display their goods, and by a small commission charged upon all orders obtained through its intervention. Most foreign export agencies publish catalogues in several languages, in which the members of the agency are systematically grouped. To each name is appended a few succinct details relating to the products and position of the firm. Export agencies originated in Germany from the absence of commission houses in the provinces, and from the wide dissemination of industries which, in England and France, are usually confined to particular districts. In Germany, the great commission houses were long to be found only in the Hanseatic towns, and principally in Hamburg. Now, however, there are many in various parts of the empire, particularly in Berlin. Since the Prussian capital became the capital of the empire, it has become an increasingly important centre of industry and commerce, even as its Bourse has relegated that of Frankfurt to second place. It is important to remember, as being destructive of the most powerful argument against the establishment of similar agencies in the United Kingdom, that the greatest possible care is taken to guard against the permanent collection of samples being seen by other than foreign inquirers or buyers. At the Stuttgart agency, the show cases are covered by green curtains, after the fashion of the pictures in foreign churches, and they are raised only when foreign buyers desire to inspect their contents.

One of the most successful of the German export agencies is that at Frankfurt, which was established as recently as May, 1885, with a capital of £2,000. It is the rule here, as throughout the empire, that the shareholders in these institutions should never receive dividends of more than five per cent. The head-quarters are in a roomy old electoral palace, and they were opened in January of this year. The expenses of the first twelve months' working, including the fitting up of the building, are estimated at £900, and it is expected that the greater part of this amount will be covered by the rents of show-cases and commissions upon orders placed. The rent charged for the show-cases is not excessive: 30s. per square metre (slightly more than a square yard) per annum. Before this agency had been formally constituted, it numbered 210 members; now it has 250, one-fourth of whom are Frankfort manufacturers, dealing mainly in wines, beers, perfumery, paper and chemicals. The operations of the agency are not limited to Frankfort; any German trader is at liberty to join it. The average number of visitors each day is ten, and it is said that a considerable proportion of them come from France, America, Australia, and various parts of Asia. A satisfactory volume of business is being done and, between January and May of this year, more than 100 orders were distributed amongst the subscribers to and through the medium of this agency. The Stuttgart institution, like that of Frankfort, is purely co-operative. Amongst the more important of these agencies must be reckoned the Austro-Hungarian *Exportverein* of Vienna. This institution is very energetically conducted, and is a conspicuous success. In connection with it, there is an "Information Office," which gives much attention to the solvency of the foreign houses, principally Turkish and Roumanian, with which its members do business. Thanks to its efforts, an Austro-Hungarian trade was last year opened up with China and Mexico, and it was through its intervention that the now flourishing export trade with Java was commenced a few years ago. The *Exportverein* sent to an agent who had lived long in Java an assortment of Austro-Hungarian merchandise to the value of nearly £4000. The goods sold so well and so rapidly that the Agency shortly afterwards received an order from Java for £16,000 worth of merchandise. There are export agencies of greater or less importance at Dresden, Carlsruhe, Brussels and Amsterdam. Some of them are private adventures, but in the main they are of the same co-operative character as the flourishing institutions at Frankfort, Stuttgart, and Vienna.

### The English Labour Bureau.

For about a quarter of a century, the Board of Trade have, at intervals of three years, published, in their miscellaneous statistics, such facts as they could gather concerning the rates of wages in the more important trades of the United Kingdom. Recognising that there was a growing demand for authentic information of a practical character, dealing with the actual facts of the labour market in a universal and systematic manner, Mr. Mundella proposed—and his proposal met with general approval—to join in the administration of a new Bureau, a representative of the trade unions themselves, and he offered to Mr. John Burnett the new appointment of labour correspondent to the Bureau. It would have been difficult to make a wiser selection for the post, seeing that Mr. Burnett has, for many years, been one of the most prominent of trade union secretaries, and that his name is identified with numerous movements for the improvement of the economic condition of the working classes. Like recent appointments of working men to the factory and mines inspectorate, the employment of Mr. Burnett in a responsible administrative post is an important step in the direction of democratic progress. Mr. Burnett will become a member of the permanent Civil Service, with a salary of £300 a year, and an office in Whitehall; and it will be his special business to maintain confidential relations, as he is so eminently qualified to do, with trade union, and other industrial associations, with a view of obtaining all the information at their disposal as to the rates of wages, cost of living, and other matters of a delicate nature, which would otherwise not be communicated to the Board of Trade. Besides Mr. Burnett, the staff of the new department will consist of two first-class clerks already in the service of the Board of Trade, and five clerks of the lower division, one with duty pay, at a total additional cost to the public of about £900 a year, or £1,200 including the salary of the labour correspondent. Every endeavour will be made to publish, during the course of next year, not only the statistics of the past, but the facts of the labour market of the present day. During 1887, we may expect to see published the first of those annual volumes which it will be the more legitimate province of the Bureau to compile from the varied sources of information upon which it will draw. The authorities will aim at giving, together with rates of wages in the fullest manner possible, ample information as to numbers employed at the several rates, and the respective hours of labour exacted from each sub-division of the working classes in their respective trades. The publications of the Labour Bureau will probably receive, at any rate in the first instance, more attention from the employers of labour, than from the employed. A quarter of a century ago, the latter would have viewed with suspicion statistics concerning their own condition, but to-day, the spread of popular education, and the general amelioration of the position of the working classes, as well socially as politically, will stimulate a thoughtful study of those comparative statistics of home and foreign labour, from which the best results to the community may reasonably be anticipated. Should this hope be realised, the £1,200 a year which the Bureau is estimated to cost, will be among the most profitable investments of public money. We commend the future of the Labour Bureau to the attention of all classes interested in industrial questions, and to the special care of the labour representatives in Parliament.

According to *Kemp's Mercantile Gazette*, the number of Failures in England and Wales gazetted during the four weeks ending Saturday, August 28th, was 365. The number in the corresponding four weeks of last year was 326, showing an increase of 39, being a net increase, in 1886, to date, of 235. The number of Bills of Sale published in England and Wales for the four weeks ending Saturday, August 28th, was 933. The number in the corresponding four weeks of last year was 912, showing an increase of 21, being a net increase in 1886, to date, of 306. The number published in Ireland for the same four weeks was 60. The number in the corresponding four weeks of last year was also 60, being a net increase, in 1886, to date, of 142.



## EMINENT TEXTILE MEN. No. 4.

F. H. Bowman, D.Sc., F.R.S., Edin.,

F.R.S., F.I.C., &amp;c.

Our fourth portrait of Eminent Textile Men is that of Doctor Frederic Hungerford Bowman, who was born at Huddersfield in 1839. He is the eldest son of the late James Bowman, Esquire, J.P., of Savile Grove, Halifax. After attending a Junior School, he was educated at Longfield Academy, Halifax, and afterwards at the Edinburgh Institution, under the late Dr. Alexander Reid, where he distinguished himself by taking a large number of prizes. He completed his education at the Edinburgh University, where he was Straton Prizeman and Gold Medallist in Technology. At an early age, he exhibited great aptitude for scientific pursuits, and especially for mathematics, astronomy, chemistry, and microscopical research. After a short period of commercial training in a Bank, he learnt the business of worsted spinner, with the late firm of William Illingworth and Co., Halifax, but afterwards relinquished this pursuit, and joined with his two brothers—James M. Bowman, Esquire, and Henry H. Bowman, Esquire, J.P., in founding the extensive firm of Bowman Bros., cotton spinners, Union and Lee Bank Mills, Halifax, which are the largest cotton mills in Yorkshire, and have a high repute for the first-class yarns which they supply, both single and two-fold, for the Bradford, Glasgow, Nottingham, and Lancashire markets, as well as for the Continent. While learning his business, his scientific tastes led him to investigate the nature of raw materials used in manufacture, and the results of these labours, which extended over twenty years, were given in a series of lectures in the Bradford Technical College, and have since been published in two handsome volumes, on "The Structure of the Cotton and Wool Fibres."\* These works have given the author a world wide reputation, and are accepted as the standard works on the subject in Great Britain, on the Continent, and in America. He has also written "The Intermediate Text Book of Physical Science," in Messrs. Cassell and Co.'s new series of Scientific Text Books. For these works, he was awarded the Gold Medal of the Society of Art, Science and Letters of London. He is a frequent lecturer on various scientific subjects, and also takes a deep interest in the spread of Temperance, which he often advocates, having been a total abstainer upwards of thirty years. He is a Doctor of Science, and a Fellow of the Royal Society of Edinburgh; also a Fellow of the Royal Astronomical Society, the Linnean Society, the Chemical Society, the Society of Chemical Industry, the Geological Society, the Royal Microscopical Society, and a member of the Society of Arts and Manufactures. In connection with the latter society, he has been appointed to deliver the Cantor Lectures during the ensuing year, and also, at the request of His Royal Highness, the Prince of Wales, to write the official report on the wools exhibited in the Indian and Colonial Exhibition at South Kensington. He was, last year, the President of the Halifax Literary and Philosophical Society, and is, this year, the President of the Society of Dyers and Colourists. In addition to active participation in his own business, he is also extensively connected with other commercial pursuits, and is a director of a number of public companies, amongst which may be named the Halifax and Huddersfield Union Bank, the Equitable Insurance Co., the Equitable Accident and Guarantee Co., the Yorkshire Boiler Insurance Co., the Bradford and Shelf Tramway Co., and the Halifax High Level Railway.

\* Palmer and Howe, Publishers, Princes Street, Manchester.

## The Revival of Trade by the Development of India.

The Glasgow Chamber of Commerce, says a contemporary, has published, in the form of a pamphlet, an address delivered to the members last month by Mr. William Birkmyre, of Port Glasgow, on "The Revival of Trade by the Development of India." The author argues that the present limit of borrowing for the construction of railways and other public works in India may be safely enlarged; and he contends that manufacturers should insist that "India shall be forthwith developed in a manner commensurate to its greatness; for they would find that the increase of wealth there would most assuredly be an

increase in the wants of the people. The augmented exports from India would be largely balanced by the imports of manufactured goods from England." On the question of the Currency, Mr. Birkmyre holds that low exchange benefits India by stimulating trade. He thinks "it is really time that this question should be viewed in its national bearings, and apart altogether from the hardships it imposes on official classes in India." "I defy any of them," he writes, "to show that any additional taxes have been imposed during the many years exchange has been depreciating, to meet the increased drain upon the Treasuries of India for their European requirements. On the contrary, during the period of this depreciation, taxes have been repealed, and although the income tax has been recently imposed, it was for the purpose of meeting war expenditure on the frontier. I am well enough aware that the accounts, as presented, show a loss of millions by exchange. Those losses are purely illusory, and arise from Indian financiers valuing the rupee in their statement at the fanciful rate of 2s." Mr. Birkmyre must be aware that this is financial heterodoxy—that, however other things may change in value and become more accessible to the great body of people, silver, like the Vicar of Bray, ought always, and at all times, to occupy the same position. The Conservatives, who are great in Royal Commissions, will no doubt apply that costly, but comforting, specific to this silver disease. If the expedient does not end in a cure of the silver malady, the experiences of the patient under treatment (in other words, the evidence to be laid before the Commission) will no doubt increase the general knowledge on the subject. The public has no time to enter into a question of this description, and it is, therefore, important that the information placed before it should be fairly accurate. Sometimes even "members of Her Majesty's House of Commons" have been "kent," as Burns would have put it, to go a little "aglee" in their facts, as witness the memorial on the depression of trade now being signed in the cloak-room of the House of Commons. Our townsman, Mr. Donald Graham, in a letter to the *Times*, points out that this memorial has in part been drafted with sublime indifference to the facts. It affirms that, "on account of the continued fall in the value of silver, relatively to gold, several departments of the cotton manufacturing industry of the United Kingdom are in a state of great depression, and stand in risk of permanent injury." Now, Mr. Graham cites the Board of Trade returns to show that in the last seven months the export of cotton manufactures have shown a marked increase, and more particularly that the increase of exports to India and other silver using countries of the East has been much greater than anywhere else. He also points out that the price of cotton has been steadily advancing in the same period, and "thinks it might be demonstrated that, instead of depression in the cotton trade having been caused by the fall in the price of silver, it is, on the contrary, the extraordinary activity of the cotton goods trade with the East which, by upsetting the balance of trade, has caused the fall in exchange, and through it the fall in silver." Mr. Graham has done excellent service in pointing out in this case how important facts are frequently ignored in controversies of this description, not from any desire to misrepresent the case, but by assuming, without inquiry, that statements uttered on every hand must necessarily be accurate. Nevertheless, let us have the Royal Commission.

## Maignen's Water-Softening Apparatus &amp; Materials.

On the occasion of the visit of the Society of Engineers to the Soutwark and Vauxhall Water Company's works at Hampton recently, Maignen's "dry" water-softening process and "Filtre Rapide" was exhibited in operation. Some time since, a plant of this system was erected at the Battersea works of the Southwark and Vauxhall Water Company, to soften the feed water of the new Lancashire boiler, which had just been set, and the new boilers, since erected at the same pumping station, are supplied with water softened in the same manner. It is, moreover, intended that all the water supply for the boilers at the Hampton works shall be softened by the same process. The patented reagents used consist of a special mixture of quicklime, carbonate of soda, and alum, and are employed in the "dry" state as a fine powder, to which the name of "Anti-Calcaire" has been given. The trouble and uncertainty of making solutions are avoided. Thus the application of the process is extremely simple, and the control over the proportions perfect. The apparatus erected at Battersea is a simple modification of that illustrated in *The Engineer* some ago. The space occupied by the apparatus is very small. An additional tank of 500 gallons, and a "Filter Rapide" about 3ft. square, 4ft. high, constitute the whole plant required to soften 80,000 gallons per week. It is contemplated to transform one of the present Hampton sand filter beds into softening tanks and a huge "Filtre Rapide," to treat, in the first instance, 1,000,000 gallons of water per day. The sand will be cleared out, the bed roofed over, and 200 of Maignen's filter frames, covered with asbestos cloth, fixed perpendicularly at the bottom of the bed, the filtration taking place laterally, instead of downwards, and thus 2,800 square feet of filtering surface will be obtained in the same space as is occupied by 120 square feet of sand surface.



## ORIGINAL DESIGNS.

Our first plate contains the Portrait of Doctor F. H. Bowman, an account of whose work is on page 29.

On the second plate, will be found a very handsome design for a Chenille Curtain. It is the work of Mr. F. Layton, Halifax.

## MONTHLY TRADE REPORTS.

**Wool.**—This branch of trade has, during the month, remained in a very healthy condition, perhaps there has been a rather easy demand, but still consumption has ruled large, and prices for most classes have been firm, and an upward tendency has been visible. Colonial wools have met with a ready sale, prices having advanced, and they seem likely to keep up for some time to come. The yarn trade shows no change, spinners keeping generally busy on order. Botany yarns are in fair request, the heavier counts having risen in price. The demand for two-fold warps has not been satisfactory either in demand or prices. Export business has been fair and prospects seem brighter. The political outlook in regard to the Eastern question has had an effect upon business, but not to any great extent. In the piece branches, more business has been done both for home and American account at improved prices, but the Continental trade has slackened slightly during the past fortnight.

**Cotton.**—The markets for the raw material and yarns have, during the month, been unsatisfactory, and prices have shown a weakening tendency. Spinners still produce yarns in excess of the consumption, with the consequent effect of increased stocks, which keep accumulating. The present state of the Eastern question has affected the markets and caused an uneasy feeling in the trade. The cloth branches are having a better time of it than for some months past, owing to the cheapness of yarns, and the improved rates procurable for orders taken during the past few weeks. Where orders are now being taken, slightly lower rates are prevalent, but, as a rule, manufacturers are not disposed to accept a reduction without an effort to secure orders at late rates. Taken all round, sales may be quoted  $1\frac{1}{2}$ d. lower on the month.

**Woollen.**—Manufacturers generally are working full time, and many of them overtime, on orders that will last for some months to come. Those who were able to cover their orders with stocks of wool are now reaping a harvest, owing to the rise in value of the raw material. Fancy worsteds and woollens, of good quality and design, have still a great demand, and extreme rates are being paid for them. The demand for these fabrics is both for home and export account. The lower classes of fancy woollens are also much asked for, and rather better prices are procurable. The medium qualities have also improved. In the plainer kinds of fabrics, an improved feeling has been manifested, and, generally, the woollen department has recently borne signs of a permanent improvement. The shipping trade shows a large advance upon this time last year to United States, Canada, Australia, and the Continent. All new orders given out are at advanced rates, manufacturers refusing to accept them without an advance.

**Linen.**—This branch of trade has not changed during the month, and is generally unsatisfactory both in demand and prices. It is with difficulty that manufacturers can procure a profit for their goods, although, in point of excellence generally, they are not to be surpassed by other countries. The jute branch has shown further signs of improvement, prices of the raw material being at such rates that spinners and manufacturers are enabled to make better profits than for some time

past. The feeling is decidedly hopeful. The flax trade has been slow in most departments, there being no new features to chronicle during the month.

**Lace.**—An exceptional quietness has prevailed this branch, recently, in nearly all departments. The curtain trade is flat, and the production exceeds requirements. In bobbin and other nets, the demand has been meagre at weakening rates. Brussels and Mechlin tulle have met but little inquiry, and only a limited trade has been done in silk goods. Fancy merino hosiery has been in satisfactory demand, this being the only redeeming feature in the whole trade. Cotton hose has sold slowly at low prices. The prospects of trade during the remainder of the year do not appear encouraging.

## English Trade with Spain.

The Madrid correspondent of the *Times*, telegraphing recently, says:—According to a provincial newspaper, a special technical agent of the French Government has arrived in Spain to make an exhaustive enquiry into the nature and amount of the trade of each province, and more particularly as to the openings which there may be for the further introduction of French manufactures. Consul-General Crowe, in his last report on the trade of Cuba, states that, in all the cities of Spanish America, the French Chambers of Commerce are establishing agents for selling French manufactures. In general, such an agent possesses samples, takes orders, and gives information as to the best means of obtaining articles and making payments to the French Chambers of Commerce. These Chambers are more fortunate, or enterprising, or wealthier than those of England, for the answer just given by some of the most distinguished members of the London Chamber of Commerce to a proposal for the establishment of agencies in Spain to obtain information as to markets, to send monthly reports, and to give advice to British Chambers of Commerce and merchants, members of such Chambers, is that there are no funds in the hands of the London or Associated Chamber of Commerce. At the same time, the importance, if not the necessity, of taking some such step in the interests of British trade is fully admitted. Meanwhile, it would appear that the French are beforehand in this market also. It would be a curious commentary upon the success obtained by Sir Clare Ford in securing the Anglo-Spanish Commercial Convention if other nations by their superior enterprise should derive first benefit from it. The trade of all Spanish speaking countries will go to those nations which are most active in demonstrating the value of their wares.

## Book Notice.

*Universal Tables of Textile Structure for the use of Manufacturers in every branch of Textile Trade.*

CROSBY, LOCKWOOD AND CO., London.

So far as we are aware, the important object successfully attained in these tables has never before been attempted. Mere references to their columns will enable the manufacturer, in any branch of the textile trade, to alter the weight or fineness of his fabric, and yet to preserve the same "balance" or proportions. They embody the principle (well known and long utilised in the muslin manufacture), that any two cloths of the same materials are of the same structural character or proportions, when the multiples of their respective counts of yarn by the squares of their respective sets are equal. This principle would have been much more generally applied, were it not that, hitherto, the required calculations have been rather intricate. Mr. Joseph Edmondson, of Halifax, the author of these tables, has provided in them a means of dispensing altogether with such calculations. This will be best shown by an example. A cloth has been made with 40's warp, 52 sett, 32's weft, 12 picks. The "balance" or proportions are satisfactory, but it is not fine enough, and it is proposed to use 58 sett instead of 52. What must be the counts of warp and weft, and how many picks of the latter, to preserve the "balance" of the cloth? Referring to the table, we find in the column for 52 sett, and opposite to 40's, on the side of the page, the number 2830. The nearest number to this in the column for 58 sett is 3828, and opposite to this, at the side of the page, is 50's, which is the correct count of warp for the new cloth. By a precisely similar use of the table, we find that the new cloth must have 40's weft and 13½ picks. In these two cloths, the proportions of the diameters of the threads to the spaces between them, and the angles at which the threads will intersect each other, will be identical: in fact, the original and heavier cloth will simply be a magnified form of the second. Thus it will be seen that these tables supply a great desideratum, and, when once the manufacturer has become accustomed to their use, he will regard them as indispensable—as second in value only to his "piece glass."



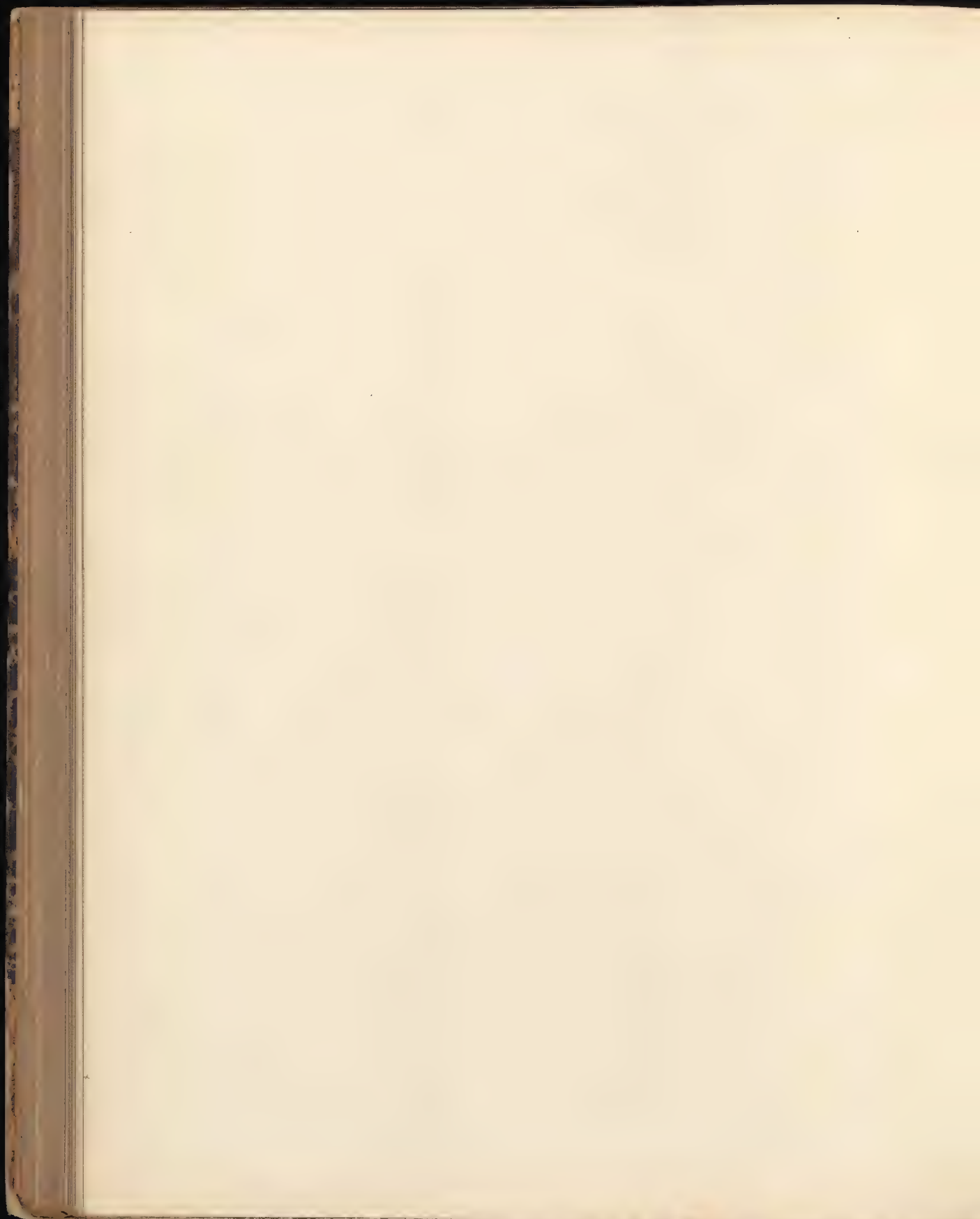
September 12th, 1886.

THE JOURNAL OF FABRICS AND TEXTILE INDUSTRIES.



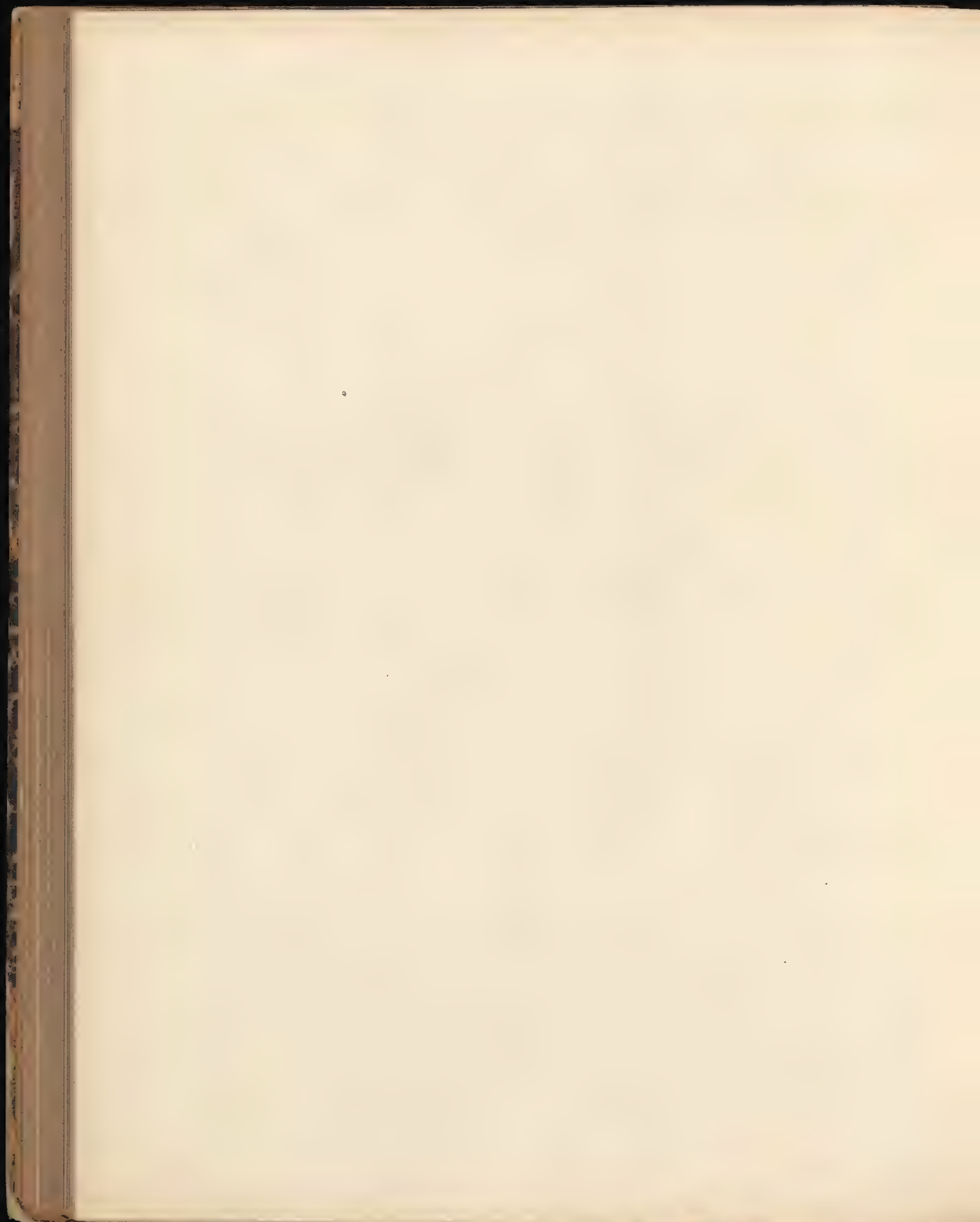
EMINENT TEXTILE MEN.

No. 4.—DR. BOWMAN.







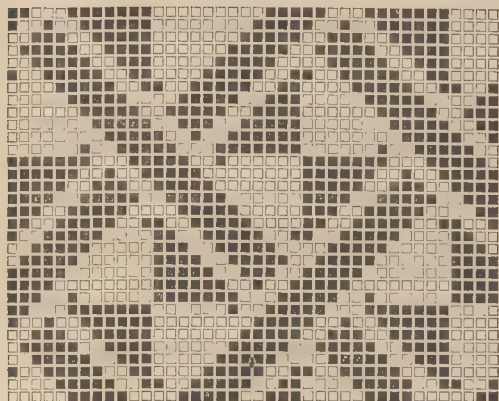




# ORIGINAL \* DESIGNS.

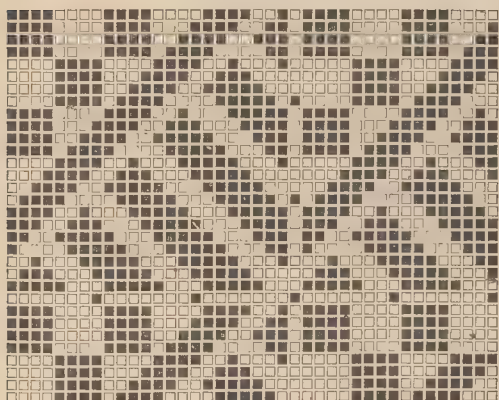
## Cotton Dress Goods.

No. 396.



Design.

No. 397.



Design.

## Fancy Worsted.

No. 398.



Design.

Weft—All Black.

Warp—2/36's.

Weft—2/36's.

76 picks per inch.  
76 ends per inch.  
6 ends in a reed.  
68 inches wide in the loom.  
56 inches wide when finished.

Warp:—1 Lavender Blue.

1 White.  
1 Brown.  
1 White.  
1 Brown.  
1 White.  
1 Brown.  
1 Black.  
1 Brown.  
1 Black.  
1 Brown.  
1 Black.  
1 White.  
1 Black.  
1 White.  
1 Black.  
1 White.  
1 Black.  
1 Brown.  
1 Black.  
1 Brown.

21 ends.

## Fancy Woollens.

No. 399.



Design.

Warp:—

2 White.  
2 Dark Brown.  
2 White.  
1 Dark Brown.  
1 Bright Crimson.

8 ends.

Weft:—

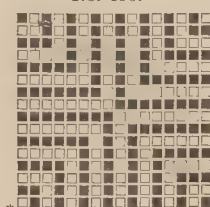
2 White.  
2 Dark Brown.  
2 White.  
1 Dark Brown.  
1 Dark Blue.

8 picks.

2/60's skeins woollen warp.  
2/60's skeins woollen weft.

60 picks per inch.  
4 ends in a reed.  
15's reed.  
66 inches wide in the loom.  
56 inches wide when finished.

No. 400.



Design.

Warp:—5 Black.

2 Blue Dark.  
2 Black.  
2 Blue Dark.  
12 Black.  
2 Blue and Amber silk.  
7 Black.

32 ends.

Weft:—7 Black.

2 Black and Blue silk.

12 Black.

2 Brown.

2 Black.

2 Brown.

5 Black.

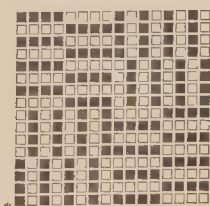
32 picks.

48 ends per inch.  
48 picks per inch.  
8 ends in a reed.  
68 inches wide in the loom.  
56 inches wide when finished.

Warp—2/30 skeins woollen.

Weft—2/30 skeins woollen.

No. 401.



Design.

Warp:—1 Crimson and Black.

38 Black.

1 Crimson and Black.

40 ends.

Weft:—1 Crimson and Black.

38 Black.

1 Crimson and Black.

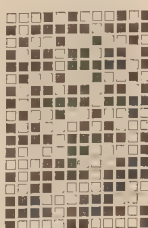
40 picks.

Warp—2/30 skeins woollen.  
Weft—2/30 skeins woollen.

48 ends per inch.  
48 picks per inch.  
8 ends in a reed.  
68 inches wide in the loom.  
56 inches wide when finished.

## Ottoman Cloth.

No. 402.



Design.

Drawn 1 worsted.

" 1 cotton.

" 1 worsted.

Face warp—2/56's worsted.

Back „ —2/50's cotton.

Face weft —2/40's cotton.

Back „ —7's skeins woollen.

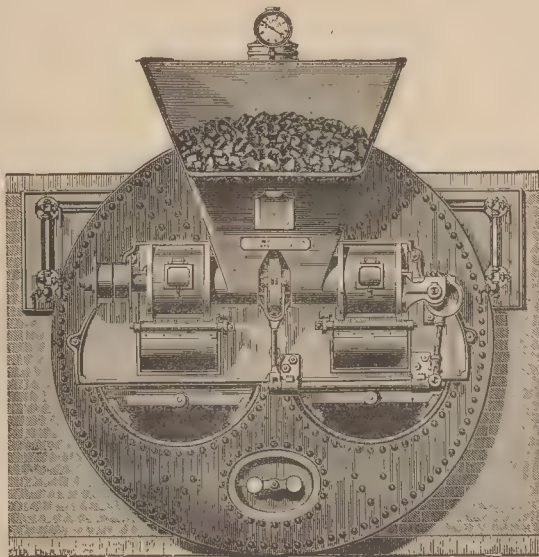
Face „ —4/12's cotton.

56 ends, face warp, per inch.  
28 ends, back warp, per inch.  
60 picks per inch.  
8 ends in a reed.  
60 inches wide in the loom.  
54 inches wide when finished.

## MACHINERY \* TOOLS, \* & C.

### The "Simplex" Patent Stoker.

At the present time, when competition in every branch of trade is so very keen, it behoves all interested to study economy in every department of manufacture. We are not advocates of what may be termed "cheese-paring" in order to save money but, on the other hand, we strongly advise all who can further their own pecuniary interests, by a judicious outlay of capital, to do so, even if an extra effort be demanded to enable them to secure this economy. Perhaps, in no department of manufacture, was there formerly so much waste as in the manner of using fuel, but, happily, through the invention of various mechanical appliances, a saving in the consumption of coal has been greatly effected. Perhaps, amongst these apparatus, none has been more effective in operation than the "Simplex" Stoker, made by Mr. Thomas Henderson, of 40, Castle Street, Liverpool. On two or three previous occasions, we have had opportunities of drawing the attention of our readers to their exceptional utility but, since that time, the thorough usefulness of this appliance having been efficiently demonstrated by tests and by continued use in some of the largest firms of the country, it may not be amiss on our part to give further particulars of the apparatus. We do not intend making comparisons between this and any other stoker, as the merits of the "Simplex" have already been fully appreciated. We may state that for one firm, (employing nearly 5,000 hands), Mr. Henderson has fixed his "Stoker" to no fewer than 70 furnaces. The main points of the mechanism can be seen from the annexed illustration. The coal, after

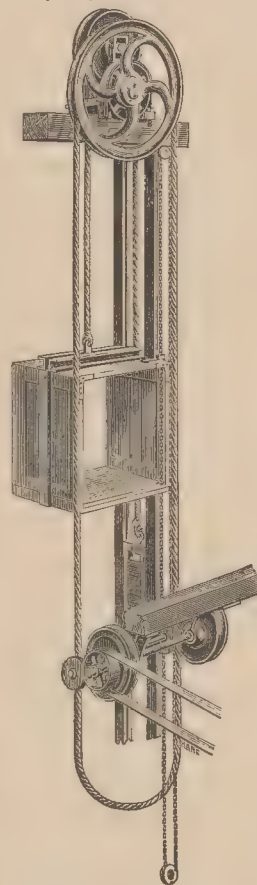


passing through the hopper, is carried towards each furnace by a helical ram driven by a ratchet and pawl, and deposited upon revolving shovels, by which it is distributed over the furnaces. The shovels are constantly revolving, and, therefore, all the springs, tappets, buffers, &c., usually necessary, are done away with. The arrangement of the machine is simplicity itself. A regular and even distribution of fuel upon the fires is secured, and the quantity required can be altered, or regulated, in the easiest possible manner, by simply adjusting the throw of the pawls. The rams are separate from each other, and can be worked independently, so that the feed can be stopped from one fire, whilst the others can be kept in full work at pleasure; this is one great advantage possessed over any other stoker in the market. The following additional advantages are claimed for the stoker:—It increases the generation of steam from a given boiler space to the extent of twenty per cent. as compared with hand-firing. This is caused by the even and regular manner in which the fuel is distributed over the entire grate surface, a bright and effective flame being thereby kept up all the time. It saves not less than ten per cent. in the cost of fuel, when the same quality is used as in the ordinary method of firing, while the manner in which the fuel is thrown on the fire causes ordinary slack to be as effective as good coal when fired by hand. The injury to the boiler, caused by the frequent opening of the fire-doors when fired in the ordinary way, is obviated. The working parts of the machine, being external to the furnace, are not injured by heat. The "Stoker" is constructed and fitted to the boiler so as not to interfere with the usual method of firing—an advantage which those who have used other mechanical stokers will fully appreciate. A great reduction in the temperature of the stoke-hole is secured by its use. It effectually prevents the smoke nuisance, and requires very little power to drive it. It can be erected on any boiler in a short time, and can be kept in repair at a trifling cost.

The fire-doors are so arranged as to admit the requisite amount of air on the most approved principle. Great durability of fire-bars and, consequently, small cost of renewing them is secured. It is believed that this mechanical stoker, with its adjuncts, possesses the best possible arrangement for fulfilling the conditions for the economical and perfect combustion of the solid and gaseous portions of fuel and for the prevention of smoke. The apparatus can be seen at the Liverpool Exhibition along with other improvements of a like nature shown by Mr. Henderson.

### J. Attwood and Co.'s Machinery Exhibits at Liverpool.

The development of machinery, which has completely revolutionised nearly every method of performing work, has exerted a palpable influence in the alterations it has effected in the manner of lifting weights. This impression is powerfully conveyed to any contemplative spectator, at the Liverpool Exhibition, who compares, with the clumsy hoisting arrangements of old, the splendid improved apparatus which Messrs. A. Attwood and Co., of the Canal Head Foundry, and Engineering Works, Ulverstone, exhibit. One of their machines is a working power hoist which possesses the peculiar property of being at any time workable by hand, quite independently of the condition, active or quiescent, of the engine, for it is likewise a power hoist. The lift itself is the firm's self-sustaining hand hoist, with the addition of a simple gearing, impelled from a shaft, and capable of attachment on any floor of the structure in which the lift is employed. Either of the two grip wheels on the shaft can be thrown into gear with one of the two V wheels, which are continuously running, so as to grip the hand rope between them. Thus the lift is set in motion in whichever direction is desired. The motion is controlled by a hand chain, furnished with self-acting stops, in the approved manner, to prevent over running at either extremity. The firm's patent self-sustaining gearing is exceedingly trustworthy and efficient. Mechanical complication is studiously avoided, and the load is sustained by an ordinary brake wheel and strap. If appearances were taken as the ground for judgment, Messrs. Attwood's improved direct-acting hydraulic lift, also one of the objects displayed at Liverpool, would be regarded as possessing no especial peculiarity. But the principal ram is tubular, and contained therein is a fixed ram of dimensions sufficient to balance the dead load of cage and ram. Overhead chains and balance weights are, by this means, abolished, and the arrangement further results in increased safety and cheaper working. Before closing this brief notice, we may mention that the opening in front of the set of Galloway boilers, employed at the Exhibition, is closed by three of Messrs. Attwood's revolving shutters, with their improved balanced gear, by which the shutter is equally balanced in all positions, enabling it to



be easily worked. These shutters have been extensively fixed in nearly every town in the kingdom, besides having been exported largely to all parts of the world. Taken as a whole, Messrs. Attwood's display is one of which, for its intrinsic worth in the department which it professes to cover, any engineering firm might be justly proud.

### Messrs. Leadbetter and Pidduck's Self-Setting (Non-conducting) Composition.

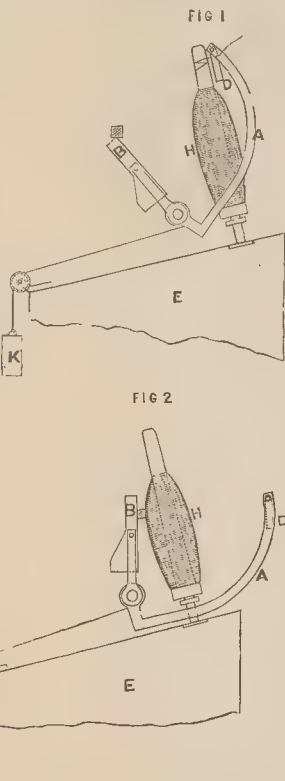
In the Liverpool Exhibition, Messrs. Leadbetter and Pidduck, Plasket Works, Canning Town, London, show, and give particulars, of their self-setting (non-conducting) composition for covering boilers, steam pipes, &c., to prevent the radiation of heat or the condensation of steam, and also for covering pipes, tanks, and cisterns, to protect them from cold, &c. As mill-owners are large users of this necessity, and as it possesses certain features of special importance, we give particulars of its application. It is used in a plastic state with a trowel on cold, with the same facility as it is on hot surfaces, entirely dispensing with the necessity of being obliged to have the steam up during the operation, and it will, of itself, without heat, in one hour, set perfectly hard. This is an especial advantage in the case of many boilers, because it admits of the interior being scurfed, and of other necessary work being done at the same time as the outside is being covered; the great



advantages of carrying on these two operations concurrently is obvious, as the saving of hours, much more of days, is always of great importance, and in addition there is the economy in fuel during the operation to be considered. This composition can be applied in one coat, and when dry, presents a perfectly smooth surface, entirely free from cracks, whilst, with those in ordinary use, three, and sometimes four, layers are necessary. The practical advantage of this new system is that any size of boiler, or number of boilers can (if desired, whether hot or cold) be completed in one operation. For covering small pipes (steam or water), the composition is supplied moulded in halves or segments of given size, two feet in length, which merely require fixing on the pipes with wire; this effects a great saving in time and of labour in application, and, if necessary, (in case of leakage or of alteration in pipes), it can be readily taken off and replaced in a few minutes without injury, or it can be applied in a plastic state with trowel as above stated. The composition is also prepared in the form of bricks, with which stationary boilers, etc. can be covered in the same manner as with ordinary bricks; these can be easily removed, and can as readily be replaced, to admit of repairs to the boiler being made. They will also be found suitable for light walls, &c., and for places where equal temperature is desired; they can be used, likewise, for the exclusion of sound. This composition adheres well to metal, and is not in the least affected by its expansion or contraction. It effectually protects the metal from oxidation, is unusually strong and durable—will neither char nor communicate fire—will at once show a leak, and will, as readily, admit of repair after the leak has been stopped, and when painted or tarred, it is not affected by exposure to the atmosphere.

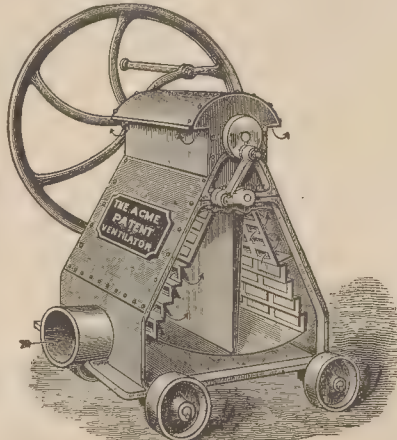
### An Apparatus for the Prevention of Waste or Slubs, in Mule Spinning.

In our last issue, a description was given of an improved method of driving spindles, invented by Messrs. Greenwood, Butterworth and Gledhill, of Morley, an advertisement of which is found on page iii. of this month's issue of the Journal, and notice is now drawn to another equally important improvement for the purpose of obviating the making of waste or slubs during the spinning operation, and at the same time, turning out a yarn, which, when woven in the piece, has fewer defects than is generally the case. The apparatus, although not complicated in any of its parts, ought to be seen in practical work to be thoroughly appreciated, and then the users of such appliances would realise the great advantage of using the above mechanism. From the annexed illustrations, a good idea of the working parts can be gleaned. Fig. 1 is a front elevation of the invention, showing the faller and thread catcher in position against the cop or bobbin. Fig. 2 is a front elevation, showing the faller and thread catcher down. To describe the operations more fully, A are the fallers, which are carried upon a shaft, B is a finger, which, as the carriage E reaches the end of each traverse, comes in contact with a pin, catch, or projection on the frame of the mule, which depresses the finger B, and so causes the fallers to rise into the position as shown in Fig. 1. D (Fig. 1) is a lathe or thread catcher, suspended by wires or cords from the fallers; when these lathes or thread catchers are moved up to the cop or bobbin H, if an end is broken, they immediately cause the broken portion of the thread to wind round the upper part of its own cop or bobbin, and at the same time prevent its coming in contact with the other bobbins, and, as a result, a considerable saving is effected, as the making of waste or slubs is reduced to a minimum. During each traverse of the mule, the fallers are returned to the position as shown in Fig. 2. The apparatus is in every respect effective in its operations, and has already been favourably received by numerous firms interested in the woollen trades, and to enable our readers to judge of its utility, the mechanism can be seen working at Morley, where the inventors will be pleased to show it in operation.



### The "Acme" Exhaust Ventilator.

The annexed illustration represents in section the "Acme" ventilating machine, and shows the internal arrangement and mode of working. The apparatus is specially adapted for the ventilating of factories, dyehouses, &c., and for the drying of textile materials in the raw state, in yarns, and in the manufactured article. It is guaranteed to overcome any resistance, and may be run at a slow speed, and, combined with a patent system of graduated extraction tubes, it is capable of ventilating large spaces. It possesses many admirable features in its working, and goes through its operations effectively. It has few working parts, and is, consequently, less liable to get out of order, than is a more complicated apparatus. Our readers can form a good idea of the machine from the following description. The vertical vane or piston is suspended from a driving shaft (in the centre of an air-tight chamber) which moves backwards and forwards like a pendulum, the shaft connecting the rod and lever conveying a reciprocating motion to the vane, which is represented at about half its stroke, working from left to right; on its return stroke the operation is reversed. The valves now shown open are then closed,



and those on the bottom of the right side of the air chamber are opened, as are also those on the upper left side, and the others are closed, drawing the air through the bottom valves, and ejecting it through the top valves, and, finally, expelling it through the hood at the top of the machine as indicated by the arrows, and so on, at each alternate movement of the vane or piston, a mid-feather partition dividing the inlet and the outlet chamber. The machine is represented as mounted on wheels for the convenience of transport, and is such as is supplied for drying and ventilating purposes. For the latter purposes generally, it is oftener fixed in any convenient, stationary position without wheels, an air chamber being fixed under the ventilator into which the air extracting pipes or tubes are led from the various apartments of buildings, ships, manufactories, &c. The apparatus is being manufactured by the "Acme" Ventilating Company, Limited, Stanley Street, Liverpool. The "Acme" system of ventilation is in successful operation at the Town Hall, County Sessions Courts, Conservative Club, and other public buildings, ships, etc.

### The Trades Union Congress.

The Trades Union Congress met at Hull on Tuesday, September 7th. The President (Mr. Maddison) delivered his address. He advised the working classes to rely on their own efforts, through trades unions and direct representation in Parliament, for improving their position. Combination would enable labourers to secure from capitalists fair remuneration for their industry. Efforts should now be made for the adoption of the eight hours' system, the promotion of technical education, and the propagation of trades unionism here and on the continent. The Congress proceeded to discuss various resolutions submitted for its consideration. It adopted one, after much discussion, in favour of making the Employers' Liability Act permanent and compulsory, and preventing workmen being contracted out of it. It also passed resolutions calling for a considerable increase in the staff of inspectors, to prevent the Factories, Workshops, and Mines Act becoming a dead letter. The Parliamentary Committee were instructed to urge the Government to appoint practical working men and women as inspectors. By another resolution the Congress advocated some Government test of fitness in persons in charge of steam boilers. It also adopted one in favour of the relatives of deceased persons, under coroners' inquests, having power to examine witnesses.

### Import Duties in Roumania.

The Foreign Office has forwarded Consular reports from the following places to the Leeds Chamber of Commerce—Tunis, Tahiti, Cuba, Canary Islands, Philippine Islands, Italy, Batoum, Loanda, The Azores, Beyrout, Salonica, Erzeroum, Austria-Hungary, Syra, Piræus, Corfu, Stockholm, Norway, Antwerp, Varna, Tangier, Batavia, Shanghai, Canton, Newchwang, Tientsin, Hakodate, Hiogo, Persian Gulf, Newport News (U.S.), Tonga, Costa Rica, Mexico, and Rio Grande Do Sul. There have also been received reports on subjects of general and Commercial interest connected with Russia, Germany, France, Turkey, and the United States; and the rates of import duty levied upon clothing in Roumania, under the new autonomous tariff. All these papers can be seen at the office of the secretary, Mr. R. K. Calvert, 16, Park Row, Leeds.

#### Rates of Import Duty Levied upon Clothing in Roumania under the New Autonomous Tariff.

Tariff Classification.	Rates of Duty.	
	Eng. equiv.	Tariff Rates. per cwt.
	Lei. b.	£ s. d.
342. Clothing, made up or not, composed of the tissues of cotton mentioned in sec. 315, or mixed with tissues of linen or hemp mentioned in sec. 325a, or with tissues of wool under sec. 289, without admixture of any other material subject to higher duties, per 100 kilos .....	180-00	... 3 13 2
343. Clothing, made up or not, composed of the tissues of cotton mentioned in sec. 316, or mixed with tissues of linen or hemp mentioned in sec. 326, or with tissues of wool under sec. 290, without admixture of any other materials subject to higher duties, per 100 kilos .....	540-00	... 10 19 11
344. Clothing, made up or not, composed of the tissues of cotton other than those mentioned in secs. 315 or 316, or mixed with the tissues of linen mentioned in sec. 327 and sec. 329, or with the tissues of wool other than those specified in secs. 289 and 290, untrimmed or trimmed with any other material than lace, per kilo .....	10-00	... 20 7 3
342. Clothing, made up or not, composed of the tissues of linen or hemp mentioned in sec. 325a, or mixed with the tissues of wool mentioned in sec. 289, or tissues of cotton under sec. 315, without admixture of any other materials subject to higher duties, per 100 kilos .....	180-00	... 3 13 2
344. Clothing, made up or not, composed of the tissues of linen or hemp mentioned in sec. 326, or mixed with the tissues of wool mentioned in sec. 290, or tissues of cotton under sec. 316, without admixture of other materials subject to higher duties, per 100 kilos .....	540-00	... 10 9 11
344. Clothing, made up or not, composed of the tissues of linen mentioned in sec. 327 and sec. 329, or mixed with the tissues of wool or cotton not mentioned in preceding sections, untrimmed or trimmed with any other material than lace, per kilo .....	10-00	... 20 7 3
345. Clothing, made up or not, composed of the tissues of linen under sec. 330 and sec. 333, or mixed with the tissues of silk under secs. 310 and 311, per kilo .....	30-00	... 61 1 10
346. Underclothing, made up or not, composed of the tissues of linen under sec. 325a, per 100 kilos .....	180-00	... 3 13 2
348. Underclothing, made up or not, composed of the tissues of linen mentioned in sec. 327 and sec. 329, but not embroidered and without lace, per 100 kilos .....	510-00	... 10 7 7
NOTE.—Clothing composed of the cotton tissues mentioned in secs. 316 and 317, in combination with linen tissues known as holland, also pay under this section.		
349. Underclothing, composed of tissues of linen not mentioned in the three previous sections, without ornaments of tulle or thread lace, per kilo .....	21-00	... 42 17 6

Tariff Classification.	Rates of Duty.	
	Eng. equiv.	Tariff Rates. per cwt.
	Lei. b.	£ s. d.
350. Underclothing of all kinds ornamented with tulle and lace, including corsets, chemisettes, collars, cuffs, handkerchiefs, &c., combined or not combined with silk ribbons or velvets per kilo .....	20-00	... 40 14 7
345. Clothing, made up or not, composed of the tissues mentioned in secs. 310 and 311, or mixed with the tissues of linen under secs. 330 and 333, per kilo .....	30-00	... 61 1 10
342. Clothing, made up or not, composed of the tissues of wool under sec. 289, or mixed with tissues of cotton under sec. 315, or tissues of linen or hemp under sec. 325a, without admixture of any other material subject to higher duties, per 100 kilos .....	180-00	... 3 13 2
343. Clothing, made up or not, composed of tissues of wool, under sec. 290, or mixed with tissues of cotton under sec. 316, or tissues of linen or hemp under sec. 326, without admixture of any other material subject to higher duties, per 100 kilos .....	540-00	... 10 19 11
344. Clothing, made up or not, composed of tissues of wool under other sections than those specified above, or mixed with tissues of cotton other than those mentioned in preceding sections, or with tissues of linen under secs. 327 and 329, untrimmed or trimmed with any other material than lace, per kilo .....	10-00	... 20 7 3

#### Sections referred to in above:—

##### WOOLLEN AND WORSTED TISSUES.

289. Tissues of wool weighing 700 grammes or more to the square metre.  
290. Tissues of wool weighing from 500 to 700 grammes per square metre.

##### SILK TISSUES.

310. Tissues and knitted wares of silk, stuffs and ribbons of silk and velvets, plain, figured, brocaded, even when mixed with real or imitation gold or silver; crepe, plain, embroidered, or figured; gauze of pure silk or of silk mixed with gold or silver; tulles and blondes, hosiery and coverlets, and haberdashery of pure silk.  
311. Tissues, knitted wares and haberdashery of silk, mixed with other materials, except real or imitation gold or silver.

##### COTTON TISSUES.

315. Tissues, neither bleached, dyed, dressed, nor figured.  
316. Tissues, white or dyed, of one colour, dressed, figured or not, exclusive of light tissues and cotton velvets.  
317. Tissues composed of dyed threads of one or more colours, printed tissues, and cotton velvets.

##### LINEN OR HEMPEN TISSUES.

- 325a. Tissues of linen or hemp, such as unbleached packing cloth, sacking, sailcloth; twills, unbleached, bleached, or woven in colours, for bedding and blinds.  
326. Ticks of all kinds, unbleached, bleached, or woven in colours.  
327. Plain linen cloth (holland) of all kinds, unbleached or dyed.  
329. Plain linen cloth (holland) of all kinds printed; handkerchiefs, with printed designs, in dozens, hemmed or not; table and toilet linen, unbleached or bleached, figured or damasked.  
330. Batiste and lawn, handkerchiefs of the same in dozens, embroidered or not, but without lace.  
333. Tulle and lace.

### Irish Lace Making.

The Committee which was formed in 1884, to encourage the production, by Irish lace-makers, of specimen laces from new patterns, have just announced their awards of prizes, which they this year offered to designers. Similar prizes were offered last year, and since then a selection of the designs gaining prizes in 1885, has been placed for execution in the hands of lace-makers at Limerick, Kenmare, New Ross, Innismacraigh and Carrickmacross. For the most part, these examples of Irish lace have been made to the order of Her Majesty the Queen, who has graciously taken a highly practical interest in the movement to improve the fortunes of the industry. Pending the public exhibition of these bits of lace, the Science and Art Department at South Kensington, whose operations in respect of Irish lace-making may be gathered from the last two or three annual reports of that department to Parliament, have caused photographs to be taken from them. Limerick lace-workers do embroidery upon fine net, and the deep flounce made for the Queen is of handsome and well-distributed conventional pattern, designed by Miss Farman, of Leicester. Her Majesty's commission has been followed by others, for duplicate specimens, from the Countess of Aberdeen and Mrs. Alfred Morrison. At Kenmare, is produced needle-point lace, remarkable for numerous small ornamental enrichments, technically



termed "modes" or "fillings in." Of the leading forms of patterns, the *coiffure* made in that style for Lady Dorothy Nevill, and the *fichu* for Her Majesty, display considerable skill of workmanship. A rich pattern for trimming a pocket handkerchief, by Michael Hayes, of London, has been rendered by the needlepoint lace-makers of New Ross. The character of this lace resembles that of certain of the lighter kinds of Venetian seventeenth century lace. Novel effects in crochet work are to be seen in a large chair cover of linen. Admirably planned and balanced insertions of Persian looking ornament, all wrought in crochet, are intermingled with the plain linen, and this results in a favourable contrast, enhancing the value in effect of the open work. Patterns of crochet laces usually consist of awkward forms massed together without order. The New Ross crochet-workers, however, now indicate that the rendering of good patterns is not beyond the capabilities of the crochet-worker. Cut linen, picked out with fine embroidery, comes from Carrickmacross. The panel for a chair-cover, and the cover for the back of a sofa, mark new departures upon the lines of cut-linen work for furniture purposes, which the Italians used in the latter part of the 16th century. Both pieces referred to are made for Her Majesty, after designs by Mr. Michael Hayes. Equally successful is the handkerchief border, made after the manner of the "punto in aria," worked at Innismacsaigh, near Lough Erne. The flounce or alb of rather coarse needlepoint lace, from the convent at Merriem, near Dublin, is over elaborated with ornamental devices, which consequently mar the excellent effect of the bold curves and fruit. Some sixty-seven designers who entered the competition for prizes offered this year, submitted 200 designs, of which fifty have gained prizes, amounting in all, to over £60. Lady Dorothy Nevill, the Hon. Mrs. Albert Petre, Mrs. Alfred Morrison, and Mr. T. Armstrong, Director for Art at South Kensington, examined the designs, selecting such as were considered to be worthy of reward. At the same time, this committee expressed the opinion that the designs selected were of even merit, and none of them were of peculiar distinction. Instead, therefore, of awarding the prizes as originally contemplated, some modifications were proposed and assented to by the competitors concerned. Margaret Fitzgerald, of Tralee, gains one of the prizes of £1 10s. for a child's collar and cuff; a similar prize goes to L. Ginsain, of Kenmare. For a "lady's plastron" (a sort of insertion for the front of a jacket), B. Murphy, of Killarney, and Miss Lyons, of London, take the highest prizes—the one for a design based upon an old Alencon pattern of inter-twining ribands and garlands of flowers, the other of sprays and bunches of flowers treated after the manner of patterns for Brussels lace. A prize of £2 is won by Emily Anderson, of Cork, for a border to a pocket handkerchief. A. G. Bradish, of Cork, Miss Farman, of Leicester, and A. J. Sothers, of London, receive a prize of £2 10s. each, for designs to be used in decorating a panel for a lady's dress or skirt. Lizzie Parry, of Cork, gains a prize of £3 for a deep flounce; and Michael Hayes a prize of £2 10s. for one of smaller dimensions. The last named also carries off the higher prizes offered for varieties of Limerick work. There are several other prize-winners, so that the committee have at command a fair number of useful designs. There is a standing difficulty, however, in getting workers of themselves to try their fortunes with a new pattern. Uncertain as to the fate of its output upon the market, without unity of commercial interest in its regulation of prices, and constantly relying upon the kindly intentioned, but frequently misleading efforts of amateur management and philanthropy, the industry is more or less enervated. No inducement, short of what is often more than a full labour price, avails in stimulating new experiment. A well-schemed and thoroughly commercial organisation might work wonders with the industry, but so long as the capitalist or administrator passes the industry over, as one not worthy of serious attention, lace-making in Ireland can have but a feeble and struggling existence. In the meantime, a ray of light seems to be afforded, when Her Majesty the Queen, and others of influential position give, as they gave last year, new orders for specially designed pieces of lace. From the new designs for 1886, the Queen has graciously ordered over £60 worth of specimens to be wrought. This valuable patronage gives the Irish lace worker the opportunity of showing that in the way of artistic ornamentation for modern costumes, she can compete with her sisters in France, Belgium, and Italy. In France, fashion is led as much by the *grande dame*, as it is by the *costumier* of the modern drama. The *haute mode* of Paris is followed by London. A small measure of independent judgment and choice, exercised by English ladies, might give a considerable impulse to the use of Irish lace. And in view of what can now be done in the way of new and pretty looking Irish laces, the preparation of *toilettes* for the next London season, might become the means of establishing a diversion to the benefit of the thousands of Irish lace-workers during the forthcoming winter months.

Parcels not exceeding 11 lbs. in weight are now received at any post-office in the United Kingdom for transmission to Newfoundland. Commencing with Tuesday, September 14th, parcel mails will be made up at Liverpool, for Newfoundland, every alternate Tuesday morning in summer, for conveyance by the Newfoundland contract mail steamers, and every alternate Thursday morning in winter, for conveyance to Halifax by the Canadian contract mail steamers. Parcels intended to be sent must be posted so as to reach Liverpool by the night mails of the previous day. In the reverse direction, the parcels will be conveyed to Liverpool by the same lines of steamers, and distributed by means of the inland parcels post.

## The Board of Trade Returns.

The Board of Trade Returns for August do not present any special feature. The improvement in trade is going on, but the progress is clearly very slow. Dealings with America are evidently expanding, but the effect of recent orders in railway material is not yet shown. Our Indian trade is also increasing. The exports of British and Irish produce and manufactures show an increase of £250,220 for the month, but a decrease of £1,479,572 for the eight months. In the imports, the loss for the month is £1,485,621, raising the deficiency on the eight months to £22,692,398. The falling off on the month is due mainly to smaller payments for food stuffs and the diminished importations of wool. Dealing first with the imports, the totals for August and the eight months were:—

	August.	Eight months.
1884 .....	£29,610,739	£262,753,496
1885 .....	28,806,976	250,287,443
1886 .....	27,321,355	227,595,045

Dealing with the month, tobacco shows an increase of £136,196, raw materials for textile manufactures £256,180. There is a loss in wool of £268,802, but cotton exhibits an increase of £448,750. In manufactured articles there is a gain of £283,948, and miscellaneous articles of £48,603. Animals living (for food) exhibit a decrease of £193,814, articles of food and drink, duty free, £71,295, articles of food and drink dutiable £651,908, metals £37,545, chemicals, dyestuffs, and tanning substances £58,023, oils £103,437, and raw materials for sundry industries and manufactures, a decrease of £1,094,527. The exports of British and Irish produce and manufactures were:—

	August.	Eight months.
1884 .....	£29,802,057	£156,463,152
1885 .....	28,494,633	142,066,567
1886 .....	28,744,859	140,586,995

In raw materials there is a gain of £74,864, yarns and textile fabrics, £272,744, metals and articles manufactured therefrom, except machinery, £106,336, all other articles, either manufactured, or partly manufactured, an increase of £104,806. On the other hand, animals living exhibit a decrease of £2,995, articles of food and drink of £69,023, machinery and millwork £139,443, apparel and articles of personal use £71,378, and chemicals and chemical and medicinal preparations a decrease of £25,685. The exports of foreign and colonial merchandise were:—

	August.	Eight months.
1884 .....	£4,077,161	£42,142,173
1885 .....	3,346,987	38,258,182
1886 .....	4,640,586	37,804,404

The imports of gold during August were £1,095,889, against £943,542 last year, making the total for the eight months £10,410,590, against £8,551,592. The exports during August were £1,056,365, against £1,788,337, and during the eight months £8,808,841, against £5,063,599. Of the past month's shipment about one half went to the United States. The imports of silver during the month were £562,299, against £934,637, and for the eight months £5,031,227, against £6,621,230. The exports for the month were £658,460, against £983,123, and for the eight months £5,098,478, against £7,200,056 last year.

## Trade Marks.

We beg to state that the answer to the question recently put by Mr. Lockwood, to the Board of Trade, on behalf of the Trade Mark Protection Society, to the effect that words divorced from their dictionary meaning will be received for registration under the Act of 1883, pending the result of an appeal, has given great satisfaction to the vast number of trade-mark owners concerned. The Government, it is thought, contemplates improving the law of the subject of Trade Marks as soon as possible. In the hope of assisting legislation, the Trade Mark Protection Society is desirous of securing the co-operation of all trade-mark owners who are not yet in communication with them, and will be glad to receive the names of such at their office, 1, Castle Street, Holborn, where the London Committee of the Society has been established since 1877, and is now being largely augmented.



### Receiving Orders.

- Knowles, B., Hartley Street, Dewsbury, Yorkshire (trading with Albert Knowles, of Wakefield Road, Dewsbury, as Knowles Brothers), wool merchant.
- Lister, S., Park Mill, Foundry Street, Halifax, Yorkshire, worsted spinner, Lymbery, F., Willatt's Factory, Regent Street, Long Eaton, Derbyshire, lace manufacturer.
- Leah, T., W. Leah, and H. Ogden (trading as the Stoodley Bridge Mill Co.), Eastwood, Todmorden, Yorkshire, cotton spinners and manufacturers.
- McAnult, S., 55, Egbaston Street, Birmingham, woollen merchant.

### Judications of Bankruptcy.

- Knowles, B., Hartley Street, Dewsbury, Yorkshire (trading with Albert Knowles, of Wakefield Road, Dewsbury, as Knowles Brothers), wool merchant.
- Leah, T., W. Leah, and H. Ogden (trading as the Stoodley Bridge Mill Company), Eastwood, Todmorden, Yorkshire, cotton spinners and manufacturers.
- Lymbery, F., Willatt's Factory, Regent Street, Long Eaton, Derbyshire, lace manufacturer.

### Dividends.

- Ridley, A. S., 90, Watling Street, London, warehouseman and manufacturer; seventh and final dividend of 1d. in the pound, by Mr. Ernest J. Husey, trustee, at 18, King Street, Cheapside, London.
- Thompson, J., and J. T. Haddon, 1, Duke Street, Bradford, Yorkshire, wool merchants; second dividend of 3d. in the pound, by Mr. Benjamin Musgrave, trustee, at the offices of Messrs. B. and E. Musgrave, public accountants, 1, Bank Street, Bradford.

### Dissolutions of Partnership.

- Bruce, T., J. Bruce, E. Bruce, W. Parker, and H. Hemingway, Heckmondwike, Yorkshire, blanket manufacturers.
- Calvert, Joseph, John Calvert, and W. Richardson, 13, Queen Street, Leeds, Yorkshire, cloth manufacturers.
- Jaffray, E. S., W. P. Jaffray, H. S. Jaffray, J. McVickar, J. R. P. Woodriff, and C. J. Hadfield, 7, St. Mildred's Court, London, American merchants.
- McConnell, J., and J. H. Booker, 9, Gracechurch Street, London, and at the Albany, Old Hall Street, Liverpool, merchants.
- Meyerstein, C. J. L., and H. Haschke, 6, Love Lane, Aldermanbury, London, merchants.
- Parr, Louisa, and G. Houldsworth, 147, Princess Street, Manchester, straining cloth manufacturers.
- Walker, H., and W. N. Walker, Leeds, woollen merchants.

## PATENTS.

### Applications for Letters Patent.

- Automatic sprinklers for fire extinguishers. R. Hargreaves, Bolton. 4th Aug. 9,977
- Application of a nip to Noble's and other combing machines. D. Denby, Hull. 5th Aug. 10,051
- Apparatus connected with change or drop shuttle box looms. E. J. Scott and A. Wadsworth, Halifax. 19th Aug. 10,617
- Apparatus to dispense with picking sticks, cams, and other mechanism. A. Whiteley, Halifax. 12th Aug. 10,321
- Apparatus for treating textile materials with gasses, liquids or vapours. W. Mather, London. 5th Aug. 10,053
- Automatic regulator for the warp beams of looms. G. F. Redfern, Finsbury. 20th Aug. 10,685
- Automatic feed paste box for pasting cop bottoms. W. Cooper and J. Cordingley, Manchester. 23rd Aug. 10,737
- Belts and ropes for machinery. W. W. Oldfield and G. H. Smith, Glasgow. 3rd Aug. 9,911
- Blue dyestuffs. Messrs. Dahl and Co., Leeds. 9th Aug. 10,134
- Brakes and crank arms for looms. T. Singleton, Darwen. 12th Aug. 10,308
- Belting for transmitting power. F. Fleming, Halifax. 20th Aug. 10,646
- Bearings and bushes for machinery. C. Bennett, Sheffield. 23rd Aug. 10,733
- Bleaching fibrous materials. J. and F. M. Gibson, Glasgow. 25th Aug. 10,842

- Cop or bobbin frames of warping, &c., machines. F. Reynolds, London. 6th Aug. 10,080
- Carding, dressing, and opening or disintegrating woollen, &c. C. Gauntlett, London. 13th Aug. 10,388
- Construction of tell-tale for use in factories, &c. F. C. Stanton, London. 17th Aug. 10,555
- Crushing apparatus, chiefly designed for burring wool. A. and A. and H. Binet, London. 18th Aug. 10,602
- Cutting or dividing plush, &c., by the double cloth method. F. Robinson, Leeds. 23rd Aug. 10,746
- Compressing bales, &c. A. P. Donisthorpe, London. 25th Aug. 10,858
- Driving the tubes on spinning and twisting frames. J. W. A. Black and H. Eade, Bradford. 9th Aug. 10,136
- Drying machines. J. H. Lorimer, London. 24th Aug. 10,806
- Expansion gear of steam engines. H. Kuhne, London. 14th Aug. 10,429
- Embroidering machine. W. E. Gedge, London. 21st Aug. 10,716
- Fire extinguishing apparatus. W. B. Dick, London. 11th Aug. 10,285
- Hollow cones or cop formers of winding frames. T. Wilkinson and J. Horsfall, London. 3rd Aug. 9,915
- Improved twist lace fabric. E. Cope, Nottingham. 31st July 9,903
- Jacquard card repeating frames. T. Nutall, Ramsbottom. 3rd Aug. 9,932
- Knitting machines. J. A. Claringburn, London. 30th July 9,812
- Knitting machines. H. J. Haddan, London. 12th Aug. 10,336
- Knitting machines. J. H. Cooper and W. J. Ford, Leicester. 14th Aug. 10,431
- Knitting machines. J. H. Cooper and W. J. Ford, London. 14th Aug. 10,432
- Knitting machines. W. R. Lake, London. 20th Aug. 10,687
- Lessening the waste arising from the breakage of yarns in spinning, doubling, and preparing machinery. A. H. Dixon and W. J. Gradwell, Manchester. 7th Aug. 10,104
- Looms. Improvements by means of which the loom is stopped when the weft breaks or is absent. J. Dodd, Manchester. 18th Aug. 10,588
- Looms for plush, &c., by the double cloth method. F. Robinson, Leeds. 23rd Aug. 10,747
- Manufacture of shuttles, bobbins and spools. H. H. Lake, London. 30th July 9,855
- Moistening the atmosphere in mills, &c. A. M. Clark, London. 12th Aug. 10,318
- Novel twist-lace fabric. E. Cope, Nottingham. 31st July 9,902
- New lubricator. M. Falk, London. 7th Aug. 10,114
- Oil can for lubricating the spindles of self-acting mules and twiners. T. Lees, Manchester. 13th Aug. 10,365
- Production of patterns on pile fabrics. J. Brown, Manchester. 30th July 9,821
- Picking straps or appliance for connecting the picking stick and picker. W. Atherton, Halifax. 31st July 9,880
- Printing upon calico, &c. J. M. Hampson, Manchester. 19th Aug. 10,615
- Reels and bobbins. A. G. Wass, London. 7th Aug. 10,113
- Rug and tidy machine for making rugs and tidies. J. Garner, Farnworth. 16th Aug. 10,479
- Rollers for spinning, preparing, doubling, and twisting machinery. G. Ryder and W. Longworth, London. 18th Aug. 10,578
- Shedding motion for looms. J. and E. Horrocks, Manchester. 30th July 9,823
- Shuttles for looms. J. Mounsey, London. 30th July 9,830
- Spinning and twisting filamentous materials. J. C. Mewburn, London. 3rd Aug. 9,943
- Spindles of machinery for preparing and spinning textile materials and other vertical or inclined spindles. G. H. Wrigley, Manchester. 5th Aug. 10,026
- Seamless bobbin for traverse warp machine. G. Owen, Derby. 5th Aug. 10,028
- Strapping or winding governor motion for self-acting mules. B. A. Dobson, Manchester. 9th Aug. 10,132
- Steam engine lubricators. P. A. Bennett, London. 10th Aug. 10,214
- Stretching and drying cloth. H. H. Lake, London. 10th Aug. 10,243
- Shuttles of looms. H. Meissner, London. 25th Aug. 10,857
- Taking-up motion of the self-acting mule. R. Woods, Ashton-under-Lyne. 2nd Aug. 9,913
- Treatment of silk cocoons, raw silk and the like. H. H. Randall, London. 9th Aug. 10,176
- Testing the purity of raw cotton. J. S. Farmer, Manchester. 11th Aug. 10,250
- Temples for looms. W. and H. E. and J. C. Lupton, London. 11th Aug. 10,270
- Winding or balling thread and a winder therefor. A. M. Clark, London. 13th Aug. 10,401
- Warp machine. J. R. Hancock and W. Dexter, London. 18th Aug. 10,586

### Patents Sealed.

5,560	8,496	8,681	8,892	9,523	9,676	5,662	8,480
9,453	11,852	877	5,143	5,518	8,701	9,195	9,865
10,083	12,863	13,144	8,378	8,927	9,858	12,923	9,735
10,034	12,570	16,008	4,814	5,113	5,826	6,070	6,116
6,195	6,264	7,152	10,508	1,510	6,427	9,086	9,583
10,151	4,811	6,172	9,482	10,275	10,277	6,034	6,374



# The Journal of Fabrics

AND

## Textile Industries.

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	Original Design for a Border for Linen Damask.
	Morton's Patent Improved Raising Machine.
	The "Oldham" Boiler Fluid.

### Notices.

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### Indian Silk Culture.

Being a Paper, on the Silks in the Indian Silk Culture Court at the Colonial and Indian Exhibition, read in the Conference Room on the 24th of June, 1886, by THOMAS WARDLE, F.C.S., F.G.S.



THE object of this Imperial and Royal Commission Collection is to illustrate the Silk Industries of India in a two-fold sense. First, it proposed to show the exact state of Sericulture in India at the present moment, the position which it occupies in the output of the raw product, which may be stated to comprise everything that relates to the cocoon and to raw silk, which is a reeled thread of several cocoons in one. Second, its phase in India, as entirely apart from the breeding of the silk-worm, in the manufacture of the great variety of fabrics of which silk comprises, if not the whole, the most important part. These may be roughly stated to be the Corah silks of Bengal, rudely

produced by looms that would raise the smile and wonder of Europeans, the coarse tusser fabrics woven in the same and other districts, the magnificent kinkhabs of Benares, Ahmedabad and Surat, in which gold and silver form such important decorative features, the plainer silks of Delhi, the delicate and beautiful silks of Thana (a very ancient Christian settlement), manufactured by a curious and isolated race of weavers, whose story, as well as work, is so interestingly told and so beautifully illustrated by Mr. Gupte, in his article on the silks of that place, in the *Journal of Indian Art*, No. 5. In the sixteenth century, there were 4,000 weavers at Thana, but now there are only seven families with fourteen looms. The rich fabrics of Yeola, situated not very far from Thana, the lovely brocades of Surat, incomparable for living beauty and Arabian grace of design, the ruder, though not less interesting, silks of Peshawar and the surrounding country, the satins of Azimgarh, Ahmedabad, Surat, Dhrangdhra and Kathiawar, the wonderfully constructed patterns of the Patolo weaving with "tie and dye" warp and woof, the silks of Behrampur, Cambay, Cutch, Indore, Kathiawar and Bombay, all testify, not only to the skill achieved by Indian dyers and weavers during many ages, but also, to the fascinations which have held these people spell-bound in the production of their fabrics of mystery and beauty. The printed silks of India, too, are by a long way not the least of her interesting decorative work. It is a great pity that anything should have superseded the permanent and striking prints of the old-fashioned pocket-handkerchiefs. I have seen them being printed on the squat tables of the Calcutta printers, with indescribable interest, who use their prettily sculptured little blocks with a dexterity and exactness marvellous to see, requiring no pin points to guide them in their repeats of patterns. The Indians, like the Chinese and Japanese, have never cared so much for what in Europe is termed excellence of quality, which means for the most part mechanical regularity in texture and pattern, and although they have had to weave with threads often much varying in regularity and thickness, yet they have, down to to-day, managed somehow or other, if they have had a pattern to weave, to put, so to speak, soul into it, and to raise it above the commonplace fabrics so often produced in modern Europe. For ages, and so long as they continued to use the natural colours which they obtained from their own beautiful dye-stuffs, coupled with an ingenious and traditional taste, they never could go very far wrong in colour. It is now impossible to observe without great regret, in passing through India, how the love of the modern brilliant European dyes has affected, to a serious degree, the products of the native loom of to-day. This is also to be observed as much in another part of silk decoration in India which is as extensive, if not more so, than weaving—viz., the ornamentation of fabrics of cotton, wool, and silk, by embroidering with a silken floss or thread. Embroidery in India is on a great scale, much of it unknown because unseen. The native ladies of Assam, for example, embroider most beautifully, not for sale, but for domestic uses and for marriage and other presents. It is purely carried on as an art, and not for commerce, and it is principally done with a silk that will one day, I feel sure, be in considerable demand in Europe—I mean the silk produced by the worm of the *Antheraea Assama*, or the Muga silk-worm. It was not known to the French, until recently, that any of this silk was exported. It has often been stated, by observers in Assam and India, that it was only produced for home consumption, but when I was in Calcutta making inquiries about this silk, which has engaged my attention now for several years, Mr. E. C. Buck and Mr. H. Z. Darrah, Officiating Director, Department of Agriculture, Assam, discovered, whilst on a tour of inspection and search in the native bazaars of Calcutta, that the embroidered turbans made in Dacca were worked upon a cloth of cotton and Muga silk, wholly embroidered with undyed silk of the same kind. This embroidery, which had been very well known as having been sent down to Calcutta, and largely worn there by the natives, and also exported into Arabia and other parts of Western Asia, but kept, and still kept, in the hands of a very few merchants, was previously thought to be worked with Tusser silk, the fawn-like colour of which it closely resembled. The history of silk is so well known that it does not require from me more than the most passing notice,



merely that which is sufficient to show that, whilst we are indebted to the sunny east for this industry, it surely travelled westward, although slowly, until we ourselves have long ceased to be the most westwardly country which has claimed a right to, and shown a qualification for, the possession of a share of working in this wonderful product of nature; it has followed our kinsmen across the Atlantic, until it almost joins hands with its mother country, which gave it birth in ages so remotely past; for, on first leaving China, it found its way through India, Persia and Asia Minor, to Europe; and in the sixth century, it attracted the attention of Justinian, who soon after gave it its first and sure start at Constantinople. We find it afterwards localised in Greece for a long period before the twelfth century, when it was known and practised in Sicily. It reached Italy in the thirteenth century, from whence it spread into France and Spain. We are indebted to the Huguenot persecution for its establishment in, if not its introduction into, England, where it has met with varying fortunes for the past 200 years. On the whole, it never was so bad, and, as some think, never so unpromising as now. We can claim as much right, although not such an ancient one, to the manufacture of silk in England, as any other European country, but we may not say the same of silk growing or sericulture proper. James I. tried his hand at that, but he made the mistake of thinking more of the mulberry tree than of the natural history of the silk-worm, for it certainly was of no use to have the silk-worms creeping out of their eggs in a climate where the mulberry leaves were not ready to feed them. The silk-worm only thrives where the climate is more congenial than it is here. There is no hope, or future, for the production of cocoons in England, but there is a good hope of a good future for the retention, development and extension of the making of silk yarns and fabrics. Why not? England possesses a splendid silk manufacturing climate, more humid, or, rather, less dry than, perhaps, any other country, good conditions for winding and weaving silk; brain power not less than other nations, and opportunities of study and technical training gradually, although slowly, developing. It has examples of ancient and modern art of the best, as well as the worst types; and these should give the best incentives to make beautiful work with either the needle or the loom, by lessons of guidance or avoidance. Why should we not resume our fair share in the production of all that silk is capable of in applied use and beauty? I am not one who takes a gloomy view of that which seems to some an impossibility or a hopeless effort. There is much, it cannot be denied, in the revival of this pursuit to attract those who wish to realise happiness of occupation and useful aims, although, perhaps, not to those who are in search of fortune above other considerations, or of speedy reward. My paper thus naturally divides itself into the two aspects of the question with which I started:—Silk Manufacturing, which we, too, in England, can share with our Indian fellow subjects, and Silk Growing, a field for India, in which we cannot hope to share, but which ought to occupy more of our care and countenance than it does. The happiness and prosperity of India is, or ought to be, involved in the happiness and prosperity of England, and contrariwise, if Imperial Federation has any meaning, and because of our grave and Christian responsibilities there. How Lyons cherishes her Gard, Ardeche, Drome and Vaucluse departments, which send to her dye-houses and looms such carefully reared silk! How these silk-worm rearing districts endeavour, by the most careful attention to all the minutiae of breeding and feeding, to furnish Lyons with silken fibre of such beautiful quality that the cultured taste gives a ready preference to fabrics produced under such conditions; and so with Italy, in both ancient and modern days! I am here to ask, why shall it not be so with us, and the beautiful silk paradise of India committed to our charge and responsibility? We are, in our sericultural wealth, through having India, more than equal to France, Italy, or any other country in the world, being, in some respects, better off than even China; for we are not confined to one species of silk, nor to two. India can boast of the greatest silk-producing fauna in the world. She has her varieties of Bombycidae, which feed on the mulberry leaf, both wild and domesticated; she has her jungle broods of worms of many sorts, more or less useful, or to become useful by-and-bye;

her Tusser silk is now an established and well-rooted industry, a few years ago in exports non-existing; her Assamese women are clad in silks of the Eri and Muga worms, of which, as yet, we know practically nothing; and silken stuffs are handed down from matron to spinster but little the worse for the wear of a generation. Of all these silks, and some others, I am here to speak to you; and having been sent out to India to learn of them on the spot, it must not surprise if I return much impressed with the necessity devolving upon us to cherish and develop her industries, so that we may have reason to know that our interests there are not wholly selfish, and that her immense and struggling populations may participate in our comforts and success. Too little regard has been paid in recent times to Indian raw silk. Its merits have been overlooked, and almost forgotten, in the incrustations of defects arising from not keeping pace with the more active thought of the West, and its continually developing appliances for amelioration and improvement of quality, as well as from other but minor causes. India sends to Europe but very little raw silk now. It was only 457,600 lbs. in 1885. In 1874, it was 2½ million lbs., and in 1870, 2½ million lbs., against an annual export from China to Europe, in 1883, of 7 million lbs., and from Japan of 3 million lbs. Just a hundred years ago, Indian silk was so good in quality as to drive out all competitors from the European market, save China and Italy. In 1884, it was so bad that European manufacturers could not buy it; it had gradually lost its reputation from want of quality. But the silk itself, that is, its fibre, as it rested in the cocoon, had not altered in these hundred years; the method of manipulation, I mean the reeling of it from its cocoon, had not kept pace with that of other countries; it had in fact fallen back, gone worse, until Indian silk almost found no place in the world's market; and more, even the manufacturing people of India would not buy it. In a few of the Bengal districts, such as Murshidabad and others, it is used for weaving Corah silks, but generally over India it is not to be found. The manufacturers of Poona told me they bought China silk because Bengal silk was of such defective quality. From the Deccan to Calcutta, and from Calcutta to Benares, and on to Peshawar, I found either China or Bokhara silk; and so down Rajputana to Ahmedabad, Baroda, Surat, Yeola, and Thana, everywhere the native silk avoided, and everywhere the same reason given, its want of thread regularity. India only wants the application of progressive observation, and the immediate adoption of whatever method the progress of science and mechanical art bring to produce better results in Europe. That there is ample scope may be inferred from the fact that, for the ten years ending 1883, we in England have been purchasing manufactured silks from countries in Europe to the extent of about £11,000,000 annually. I extract the following interesting statement from Mr. J. E. O'Connor's "Review of the trade of India in 1884-85":—"Silk was imported to a much smaller extent than in the last two previous years, only 1,831,702 lbs., which was 17 per cent less than in 1883-84, though still a very large quantity for a country which is held to be a great silk-producing country. Whatever may be the capacity of the country for producing silk in large quantities, it is clear that, while India imports more silk than it exports (the bulk of the exports being, moreover, only waste or chassam), the country must more properly be called an importer and consumer rather than a present producer of silk. Most of the imported silk comes from China and from Siam, *via* the Straits for Bombay mainly, and Burma in smaller degree. Even Bengal, however, the great silk-producing province, imported 212,349 lbs. of silk last year."

*To be continued.*

A wholesale and retail emporium of French fabrics and other products is about to be established at Salonica, under the style and title of "Grande Magasins Parisiens de Macédoine." This is the result of the combined efforts of French merchants residing in that place, and of manufacturers in France. It is hoped that a very large trade may in this way be developed, Macedonia being exceptionally well situated from a geographical point of view, and Salonica being, moreover, a regular place of call for all steamers plying to and from the East.





### Mr. George Hodgson, Loom Maker, Bradford.

The rapid strides that have been made in every branch of industry in the United Kingdom, during the past forty years, is something remarkable, and, perhaps, in no branch has more advancement been made than in the various departments of textile manufacture. If we contrast spinning and weaving machinery, of a generation ago, with that now in use, the gigantic improvements that have been made are very striking. In the weaving branches, the advance has been especially rapid in nearly all classes of looms. Numbers of inventions have been patented for every portion of the mechanism, new motions have been applied, and in fact, the loom of the present day seems as nearly perfect as possible. Few men in this country, in the worsted trade, have done more than the subject of this sketch, Mr. George Hodgson, loom maker, Thornton Road, Bradford, of the rise of whose works we propose to give a few particulars. He commenced his business in a very small way in the year 1848, renting at that time only one little room of the mills which he now occupies, and of which he is the owner. In the same mill he served his apprenticeship, worked as a journeyman, and afterwards acted as manager. When in the latter capacity, it struck him that with special machinery for building looms, they could be made to produce considerably more work, and of a better quality, in a given time; and with this idea before him, he commenced business on his own account. At that time, the looms being run in Bradford and district averaged only about 100 picks per minute, and Mr. Hodgson fitted up his works with special machinery, and within a short time exhibited a loom in his own town which ran at 160 picks per minute. This fact soon told its tale in the district, and within twelve months he was making from thirty to forty looms per week, and since that time scores of thousands have been turned out of his mills. As business increased, Mr. Hodgson had gradually to extend the area of his works, by purchasing and building additions to the premises, until now they are of great extent. In the various departments, from the foundry to the loom fitters' shops, every part of a loom is made, in addition to motions of different kinds to be applied to various classes of looms. It would take up too much space to give a description of the interior of the works and of what is done there. As an exhibitor, at the chief International and other exhibitions, Mr. Hodgson has been eminently successful, having received the highest award on every occasion. As an exporter, he has done a very extensive business, nearly all the leading firms upon the Continent having had looms of his manufacture. He is also a large employer of labour as a worsted spinner and comb, having a flourishing concern where he carries on this business. As a public man, he has filled various offices, the leading being those of Chairman of the Yorkshire Banking Co., Leeds, Chairman of the Yorkshire Boiler and Steam Users Co., and Chairman of the Clay Lane Iron Works, Middlesboro'.

It is stated that some of the largest of the railway companies, are making alterations in their rates, with the view of bringing nearer together the charges on home and imported produce, which have been so much discussed of late.

### The Revival in the Woollen Cloth Trade.

The remarkable increase of activity in the cloth manufacturing industries of Leeds, caused chiefly by the greatly advanced cost of wool, is being fully maintained. Now that the rise in the price of raw material has become established, manufacturers who use wool experience less difficulty in insisting upon their quotations. At all the cloth-making factories of this district, there is work in abundance. In numerous instances, order books contain contracts which will occupy full staffs and all existing plant until February. The question that all concerned are asking is—How long will it last? There seems to be a general impression that, in the absence of any reaction through another season, the improvement may consolidate itself and become permanent. Much, of course, will depend upon the extent to which the speculation mania underlies the upward movement. That cannot very well be ascertained for a while. Since rates began to stiffen, purchasers, both of the raw material and of piece goods, have been buying almost to the utmost limit of their requirements—in some cases beyond that point; so that unless this is followed up by a real demand, the effect must be at least as disastrous as the fluctuations of 1879 and 1880. The fact cannot be overlooked that the revival has come from the wrong end, taking a manufacturer's point of view. It has arisen from the supply rather than from the demand. The hardening in the price of wool is mainly due to French competition in the London wool market; hence, as a pessimist would put it, "the improvement does not come from the bottom, and should therefore be discounted a little."

However, there exists in the minds of wool dealers, cloth manufacturers, and cloth merchants, a strong settled belief that, at the worst, wool will not rebound to a point so low as that at which it stood before the recovery of value set in. Moreover, should a serious check come, it is not likely that stocks of the manufactured article bought in excess of requirements will be considerable. The revival found manufacturers in the healthiest condition possible in one sense. Trade having, for a long period, been bad, they had reduced expenses to a minimum. For years, everything, including labour, has been bought as low as it could be, and as to the extent of stocks, business has been worked pretty much on the hand-to-mouth principle. Although a good deal of overtime is now being worked, goods are being delivered as they are made, to a larger extent than was possible when merchants could make their own terms. Manufacturers, who bought yarns before the advance, are in a position to take orders at something under the average prices current: but the bulk of the contracts now being secured are at the higher figures. Some of the best authorities on commerce in general, and on the textile trades in particular, in the West Riding, are of opinion that a continuance of the existing healthy

tone must depend, above all else, upon an improvement in the other staple industries of the kingdom. As far as Leeds is concerned, one or two departments of the iron and engineering industries are already being quickened a little, though as yet but very little, by the vigour which prevails in the cloth trade. A spirit of confidence, however, based on the belief that, sooner or later, the revival in woollen cloth manufacturing must affect for good other industries, is spreading. If the yield from the harvest be satisfactory, and the signs which give colour to hope in several other directions turn out well, and the prospect of the resuscitation, which is now finding its way into every department of the Leeds cloth trade be lasting, hopes for the future may be considered bright. It is a peculiar fact that, with a rising market, the United States have not come forward with the spirit that was anticipated. Notwithstanding all the encouraging rumours that have been flying about London, reports from the States are not as cheering as they were at this time last year, and most exporters to transatlantic markets appear to be very little moved by the possibility of such cloths, as they supply themselves with in Yorkshire, becoming dearer and dearer. Some American houses, however, have of late been doing a fair amount of business in this quarter, and representatives of Leeds firms have been successful beyond their expectations in Canada. Some of the Canadian merchants who usually come over in September and October have arrived, but they have so far operated with caution. Many others have still to come, and better things are expected of them. The phenomenal rise in Buenos





Ayres wool has rebounded to a notable extent upon money exchanging in that quarter, bringing it more into unison with the gold value of the South Americans, who are better customers in West Riding markets than they have been for many years. In woollen fabrics, more business is being done with Sweden, Norway, Holland, Belgium, Italy, South Africa, and a few less important places. A correspondent writes—The effect of the extraordinary rise in the price of wool is not so marked in the heavy woollen district, of which Dewsbury is the centre, as in Leeds and Bradford, where more wool is used, and where the fabrics made are of a finer texture. Nevertheless, the cost of rags, shoddy, and mungo, which form important constituent parts of the cloth manufactured at Dewsbury, has for some time been advancing, in sympathy with quotations for wool. The finer descriptions of these in materials command considerably higher rates than they did a few months ago, and even the coarsest kinds of raw stuff fetch decidedly more than they have realised any time this year. As rags vary in quality and price almost as much as the manufactured article of which they ultimately form a component part, any attempt to indicate precisely the aggregate addition to the value of this class of unworked goods arising from the upward movement in wool would be misleading. However, best merino rags are selling for somewhere about 20 per cent. more than they did a month or two ago, and rougher sorts have followed suit in their due proportion. In the Dewsbury district, as in Leeds, Bradford, and elsewhere, the cheapness of wool has resulted in its displacing commoner classes of material to a large extent. For nine or twelve months wool has gradually been increasing as a constituent of the lighter kinds of cloth made in this neighbourhood. With reference to the staple commodity which has long given the name of "The Heavy Woollen District" to this quarter, it should be mentioned that in recent years the manufactures of this vicinity have been quietly undergoing something in the nature of a revolution. Such heavy woollens as the high-class pilot—formerly an important item in the Dewsbury clothing market—have gone almost entirely out of vogue, or what are worn abroad are made there. Adapting their productions to the variations of fashion, the more enterprising of the manufacturers of Dewsbury and Batley have, to some extent, taken to the making of lighter fabrics almost similar to those with which Leeds and Bradford millowners are keeping well to the fore. But as the buyers of a very great proportion of the cloths produced at Dewsbury, must be supplied at a price very near to what they have been accustomed to paying, manufacturers who have discarded mungo and shoddy for wool must, with wool at its present price, consider the advisability of harking back again to the coarser material. Some of the leading manufacturers in this district attribute the advance in wool to the extent of from 30 to 60 per cent. in the first instance to the French demand for colonial fleeces in London; and, secondly, to the droughts which have compelled many of the great sheep-raisers of Australia to give away stock for which they possessed no provender. Doubt is expressed on several hands whether the French competition is honest or speculative. The rumours of numerous inquiries for piece goods from America, which are current in London, are the subject of much talk in this part of Yorkshire, but the possibility of a greatly increased Transatlantic demand has not yet had any appreciable effect either upon prices or upon the volume of trade being done. A majority of opinion seems to favour the idea that nothing short of a general commercial revival will give to the Dewsbury cloth trade the lasting stimulus that it needs. Manufacturers are asking more for fabrics of every kind, but so far, customers are trying to hold out against cloths which have little wool in them. They are anxious not to buy more than will meet pressing needs till they see whether the increase in the cost of the raw article can be established. \* \* \* The possibility of a permanent advance upon cloth of every sort has not yet increased the aggregate volume of trade, in the heavy woollen district, to anything like the extent of the revival in Leeds and in other towns where the production of light dress and other cheap goods from wool has of late been so much developed. At all the mills full ordinary hours are being worked, but overtime is exceptional. Sellers, who will do business on the old terms, and manufacturers of specialities are very busy; indeed, a majority of firms in the cloth trade have work enough in hand to last them to the end of the year. "But," remarked one authority of very high standing, "Dewsbury manufacturers will be the last to get the advance in quotations, because, after all, the great bulk of the material

which they use has not yet increased in value anything like the rise in wool." At some of the mills and warehouses, stocks have been considerably reduced since prices showed a tendency to harden; hence the replacing of this stock is increasing the output of the looms of the district appreciably in the aggregate. Most manufacturers appear to be determined to insist upon higher figures, and many of them seem to be certain that an all-round rise is inevitable. In many instances, manufacturers must necessarily adhere to the old prices for season orders, part of which had been placed before the increase in the cost of material. In these cases, higher quotations are being made for repeats. Blanket makers are busier than they have been for a long period, and the average current prices in this department indicate a definite advance upon the rates which ruled the market a month or two since.

According to the latest advices from Victoria the woollen manufacturers are pressing for heavier tariffs to protect them against the competition of Yorkshire and Lancashire. An interesting manifesto has just been issued by the Protective Union of Ballarat. After declaring that of all the industries which have sprung into existence in Victoria the manufacture of wool most strongly claims "the fostering care of the State," the circular proceeds:—"In New South Wales this industry is in existence, but it has not been developed to any extent because the Government of that colony has withheld from it the necessary nourishment of protection. The case has been different in Victoria, and with the small allowance of duty conceded to the Victorian manufacturer, our mills were able for some years to hold their heads above water. But the great changes which have taken place for the last few years now demand that further concessions be granted. By reason of the reductions in freights and the growth of trade in all-wool growing countries, the European manufacturer is able to purchase in Europe on quite as favourable terms as any Victorian buyer who bids at a Melbourne Wool Sale. Owing to the undeveloped state of the iron and coal resources of Australia, the local manufacturer is under a disadvantage in respect to the high cost of fuel, and he is still more heavily handicapped by having to pay larger prices than his European competitor for all kinds of machinery and plant. There are now nine woollen mills in Victoria, which afford employment to upwards of 1000 operatives, and the capital sunk in which may be roughly estimated at £500,000. Upon this large sum of money no return in the way of interest can now be obtained; on the contrary, in glancing over the history of the various concerns for the past few years we find that one half of their number have at some time or other during that period been obliged to close their doors rather than continue unprofitable operations. Only the other day one company was obliged to suspend operations, showing a heavy balance on the wrong side. The future is not any more promising, unless additional duty be imposed by Government upon the ruinous and low-priced importations with which the market is now swamped from England and Germany. The annual value of woollen imports is computed at £1,000,000, while the output of Victorian machinery does not exceed £150,000. The question is, What is to be done? Is the Yorkshire and Lancashire manufacturer to continue sending unchequed his sham material, made up from wool and cotton refuse of all descriptions in order to land it at our ports at prices against which we can never attempt to compete? We maintain that it is desirable, in the interests of the general public, to impose such a duty as will enable the Colonial manufacturers to offer a sound and genuine article without having it superseded by one which can never give satisfaction in the end." Then follows a skilfully worded appeal for the support of the working classes. It is noted that "hitherto operatives employed in the woollen factories had been obliged to work for 60 hours per week, at lower rates of remuneration than are enjoyed by other artisans whose hours of labour are only 48 per week. A prohibitive tariff will enable the woollen manufacturer to work his factory the same number of hours as other trades, and at the same time will put him in a position to give reasonable remuneration to those engaged in the industry. Unless the proposed duty be granted every woollen concern in the Colony will be forced to close its doors, throwing out of employment a large number of persons, many of been induced to settle in Victoria by reason of the prospects offered by the trade. There has been no increase during the past ten years in the productive capacities of the Victorian factories. Moreover, of the 300 looms in the different factories many are at the present moment unoccupied for want of trade, while the importers are bringing into the Colony enormous con-



signments of other nations' products. But if proper protection be granted the Victorian demands alone will require four times the amount of machinery and hands within a very short period. The wages which are now distributed among the woollen factory operatives do not amount to more than £60,000 per annum, but the proposed alteration could not fail to induce capitalists to launch fresh concerns sufficient to bring that item to nearly a quarter of a million." The duty already levied on wool imported into the Colony amounts to 15 per cent., and the proposal of the Protective Union to increase it to 25 per cent. has met with opposition in several quarters, notably among the clothing manufacturers. A mass meeting was held in Melbourne, convened by the Clothing Manufacturers' Association, and described by the promoters as a "meeting of protectionists to protest against the action of other protectionists," and resolutions against the increased tariffs were passed. The Government, however, have decided on the following alterations:—To raise the duty on woollen goods to 20 per cent., to raise the duty on imported clothing from 25 to 30 per cent., and to offer a bonus of £5000 for the first 10,000 yards of worsted stuff made in the Colony.

#### EMINENT TEXTILE MEN. No. 5.

##### Samuel Cunliffe Lister, Esquire.

Samuel Cunliffe Lister, Esquire, was born at Calverley, near Leeds, in the year 1815, being a descendant of one of the old county families—the Listers of Manningham. When the subject of our sketch was two or three years of age, his father, Mr. E. C. Lister, removed to the family mansion of the Listers—Manningham Hall, where the former resided until the year 1870, when he sold this estate, worth £193,000, to the Corporation of Bradford for a public park. Mr. Lister offered it to the Mayor for £40,000, but some members of the Corporation thought the price too high; upon which he withdrew the offer, and to prevent all doubt or dispute as to its worth, he proposed to have it valued, and to take £20,000 less than the valuation, whatever that might be. The Mayor then wrote to ask him to renew the offer of £40,000, which was accepted. In honour of the benefactor, the park was officially named "Lister Park," and in it was erected the statue of Mr. Lister, which was unveiled on May 15th, 1875, by the late Right Hon. W. E. Forster. From boyhood, Mr. Lister was taught to regard the Church as the scene of his future labours, but after receiving an education at a school at Clapham Common, instead of passing, as it had been intended, to a University, he obtained a position in the counting-house of Messrs. Sands, Turner and Co., Liverpool, where he received the preliminaries of a commercial training, and from which port he made several voyages across the Atlantic, and, whilst in the United States, learned what was taking place there in the way of inventions and enterprise. Mr. Lister then severed his connection with the Liverpool firm, and commenced business in Bradford. Manningham Mills, the scene of his labours, were built in 1839, and burnt down about 1873, and were then rebuilt by Mr. Lister as they now stand, costing about £500,000. The business (worsted manufacture) was carried on by his brother and himself, under the style of J. and S. C. Lister, for about three years, when his eldest brother—who had just succeeded his father as Member for Bradford, died—and his partner, Mr. John Lister (who has changed his name to "Kaye"), inherited the family estates, and retired from business, which was then given up. About this time many inventors at home, in France and America, were turning their attention to the production of a machine that should supersede hand work in

##### The Combing of Wool

for the spinner, and Mr. Lister's notice was drawn to one of these machines upon which Mr. G. E. Donisthorpe, a Leicester man, had spent many years, and had ruined himself in endeavouring to comb wool by machinery; he was granted a patent in 1842, and Mr. Lister bought the half of this for £2,000, and the second half some time afterwards for £10,000. He then took Mr. Donisthorpe into partnership, and with the patience and perseverance which have characterized him in all his labours during his long life, he, in connection with his new partner, set himself to overcome whatever difficulties lay in the way of success, and spared neither time nor fortune in order to reach the goal aimed at, until at last the

machine, after undergoing many changes, became a success, and in 1844 he sold a large number to Messrs. Wood and Walker and Messrs. Rand, the two largest and oldest firms in the trade—and the first pound of fine Botany wool was combed on this machine by Mr. Lister at Manningham Mills, in 1843, and he claims, therefore, to have mastered wool combing from that date. Several inventors laboured with this object in view, amongst whom were Joshua Heilman, a Frenchman, the proprietors of whose machine and Mr. Lister, in 1852, entered into litigation, the former claiming that Heilman had patented his machine in England, and the court decided against Messrs. Lister and Donisthorpe. Heilman's patent was not granted till 1846, and the first machine was exhibited in 1851. Wool combing had been mastered, therefore, many years before his appeared on the field. At that time, 1851, Mr. Lister had three successful combing machines at work, the "Original Machine," the "Square Motion," (which Mr. Holden now works so extensively), and the "Nip" machine; it was this last machine that Heilman proved to be an infringement—but to show the difference in the value of the two machines:—when Heilman's patent expired, and the public could have the free use of it, they continued to pay Mr. Lister a thousand pounds per machine, patent right, rather than have his for nothing. It was

##### The Largest Patent Right ever Paid

for any machine in the annals of invention, the first cost of it being only £150. We may here remark that Mr. Lister afterwards obtained a verdict against Heilman for infringement, but to avoid further litigation he bought the patent for £30,000. He was now obliged to defend himself against rival inventors, and spent, during many years, large sums of money in this object, but, in the end, he possessed such an extensive wool-combing business that it was necessary to commence branch establishments, which were opened in Bradford, Halifax, Keighley, &c., &c., and after the lapse of time, he began mills in France and Germany also. During the whole of this period Mr. Lister was continually making improvements in, and additions to, his combing machine, and most of those who have aided in developing this class of machinery have been associated in a greater or lesser degree with him. Having satisfactorily solved the machine-combing difficulty, Mr. Lister now set himself the task of producing, not one only, but a whole series of machines that would

##### Successfully Manipulate Silk Waste

and imperfect cocoons in such a way that the goods produced should be equal to those manufactured from perfect specimens. His attention had been drawn in 1854, by a silk broker, to some Indian waste silk called technically, "chassam;" this description of silk, at that time, no one could use, and there was a large stock in the London Dock Warehouses. He bought considerable quantities for a half-penny per lb., and after struggling with it for many years, and spending and losing above a quarter of a million sterling, he succeeded in mastering it. It was at this time, 1864, that his last partner, Mr. Warburton, left him, believing that Mr. Lister's inventions would ruin him, and he has not had one since. He paid Mr. Warburton's share of the loss, £50,000. Having accomplished so much, he next turned his attention to the loom for weaving silk goods. The original velvet loom came from Spain, where it worked so well? that it ruined those who had it, and to put it very short, after taking out over a dozen patents, and working at it for seven long years, and losing money every year, Mr. Lister and Mr. Reixach succeeded in making it commercially successful, and since then, Mr. Reixach has had it altogether, and exclusively to himself, and "to whom," says Mr. Lister, "all honour is due for its wonderful success." We may here shortly remark that

##### His First Patent for Weaving Velvet

by power was taken in 1855, but it was for a wire loom, and did not succeed. It is impossible, in the short space at our command, to do justice to the immense labours, and the apparently unsurmountable difficulties that have been overcome by Mr. Lister, for it has truly been said of him that, "he has spent his life among inventions, having registered more patents than any other man in England; in carrying out improvements in machinery of one kind and another, he has spent fortune upon fortune, always, however, holding on until success has been won, when his outlay has come back to him fourfold."



Messrs. Carpmiel, who have been Mr. Lister's patent agents for 43 years, have registered no fewer than 107 patents in that time. His last baby, rather a big one, is a self-acting dressing machine (and the only one in the world), and is about thirty yards long, and weighs about twenty tons. Being now in possession of suitable machinery for his purpose, waste silk from Persia, China, Japan, India, Italy, and other producing centres, found its way to Manningham Mills, and Mr. Lister, in 1874, also purchased an estate of 1,000 acres in Assam, on which the raw material was to be produced, but in consequence of the difficulties arising from want of labour, that project was abandoned, and the land was turned into a tea garden. At the present time, Mr. Lister has several hundred acres of mulberry plantations in the Punjaub, and about two thousand at Dehra Dun, in the North West Province, where the Assamese worm has been introduced, and where the Italian and Japanese worms are been reared, but so far the plantations are not of sufficient age to produce any silk. We have seen that the first portion of the manufacturing life of Mr. Lister was occupied in bringing to perfection, and putting into operation, the wool-combing machine, and the second period of his commercial career in inventing and perfecting appliances for the utilization of waste silk. We must not omit to mention that the greater portion of the silk plush goods manufactured in England, and which have had so great a demand during the past few years, have been woven at the Manningham Mills, many patents, in connection with the production of which, having been registered by Mr. S. C. Lister. Lately, however, other firms in both Yorkshire and Lancashire, have entered into competition with him. Mr. Lister resides at Swinton Park, Masham, which he purchased for £400,000, the rent roll of which is £12,000 per annum. As a public man, Mr. Lister cannot be said to have occupied a very prominent position. It is rather as an inventor and a promoter of English manufactures that he has been most at home, and that his name will be handed down to posterity. Still he has not neglected the calls of his own neighbourhood. On the formation of a Rifle Volunteer Corps in Bradford, he fulfilled the duties of Lieutenant-Colonel for several years, and the Bradford Chamber of Commerce has been indebted to him for the clear way in which he has explained the working of the Patent Laws, with which he is thoroughly well acquainted. In politics, Mr. Lister is a Conservative and a Fair Trader; at the General Election, of 1880, he was chosen, along with F. S. Powell, Esquire, to contest the Northern Division of the West Riding, against Lord F. Cavendish and Sir Mathew Wilson, but was unsuccessful, and at the General Election of 1885, he was unsuccessful in securing a seat in Parliament. At the close of September (this year) Mr. Lister paid his first visit to his mills, after a four months' absence, occasioned by a severe illness. To mark the esteem in which their employer is held, the work-people at Manningham Mills presented him with an address, which had been obtained by means of subscription.

In order to give our readers an idea of the magnitude of the work carried on by S. C. Lister, Esquire, we may state that he had spent over a quarter of a million on silk waste (chassam chiefly), before he realized anything, and since then, considerably over £100,000 more. He estimates that he has expended on patents and patent inventions, not less than £600,000.

### ORIGINAL DESIGNS.

Our first plate contains the Portrait of Samuel Cunliffe Lister, Esquire, a sketch of whose life is on page 41.

On the second plate, we give a design suitable for a Printed Blind. It has been drawn by R. T. Lord, 97, Park Road, Bradford.

The third plate contains a handsome pattern, specially drawn by J. G. Bownis, 118, Everton Road, Manchester, for a Border for Linen Damask. It may be utilized for several other purposes.

## MONTHLY TRADE REPORTS.

**Wool.**—At the London Sales, nearly all classes of wools have sold briskly, and good combing sorts have fetched top prices, whilst medium and faulty kinds have kept fairly firm. In Liverpool, the attendance at the Sales has been good, and an average rise on July rates has taken place of 1½d. to 3d. per lb., according to quality, &c. The biddings have been brisk. In Edinburgh and Glasgow, trade has been very active during the month, the attendances at the Sales being much above the average, and competition very animated, prices all round being higher. Cheviot wools, especially, have sold well at higher rates and, owing to the excessive demand, the market is almost devoid of stock. In Bradford, a considerable trade in the raw material has passed, and gradually advancing prices have been paid for nearly all descriptions. The yarn branch has improved as regards home trade, and a good business has passed for export. Spinners are chary of taking large contracts unless at a stiff advance, and, therefore, generally higher rates are being paid. The piece trade is more satisfactory, but an advance in price in proportion to the advance in wools is not obtained without some difficulty. American trade has improved and there have been more orders for the East. The Continental trade is the least satisfactory.

**Cotton.**—Trade in the raw material, yarns and cloth has improved in nearly all departments, prices all round have had a hardening tendency. Yarns for export to the East have met with good sales and much old stock has been cleared, in many cases, at advanced rates. The Continental branches have also shown a marked improvement. The sales of cloth have been about on an average with last month, but at rather higher rates. Spinners and manufacturers cannot be considered to be in a much better position than during the past few months, as, although prices have improved, they have, to a great extent, been counteracted by the rise in the raw material. Those spinners who held a large stock of cotton before the rise will of course benefit by it, but there are few who are in this position, preferring to buy as they required it. On the whole, the outlook for the cotton trade is more promising than for some time past, and both spinners and manufacturers are more sanguine for the future.

**Woollen.**—The aspect of this branch of industry is, on the whole, cheering. Full time is being generally run, even in districts where, for the past three or four years, trade has been slack. Manufacturers are, as a rule, insisting on advanced rates being paid on new orders, commensurate with the advances made on the raw material. In some cases they are not successful, and this may be said to be the only drawback to this trade. Of course, those manufacturers who have been able to lay in a good stock of wools have not this difficulty to contend with, and their position is rather enviable to others who have not been able, through circumstances, to do this. The demand for fancy worsteds and tweeds of good quality is still sustained, and the same may be said of high-class mantlings. The lower classes of goods have also met with much favour, especially those for the ready-made clothing departments. In the heavy woollen districts, more business has been done both for home and foreign account, and this branch wears a more cheerful aspect than for some time back. In the miscellaneous branches, pilots, presidents, worsteds and naps, are in chief demand, and for these better prices have been obtained. Generally, the aspect of the woollen trade is bright for the future, and manufacturers are sanguine of a good trade for some months to come.

**Lace.**—This trade still remains in a very languid condition in most of its branches. The curtain department shows no sign of improvement in any respect, in fact, competition seems to get keener, and prices less remunerative month by month. Much machinery keeps idle, and, judging by reports from manufacturers, seems likely to remain so. Bobbin nets have sold moderately well, and the same may be said of laces in mixed colours. There has been a little inquiry for Torchon, Brabant, Maltese and such like laces, but the general run of millinery goods has sold meagrely, and the tendency of prices has been downwards. In the hosiery branches, merinos, cashmeres, and fancy goods, have met with a fair sale, but all white goods have been neglected.



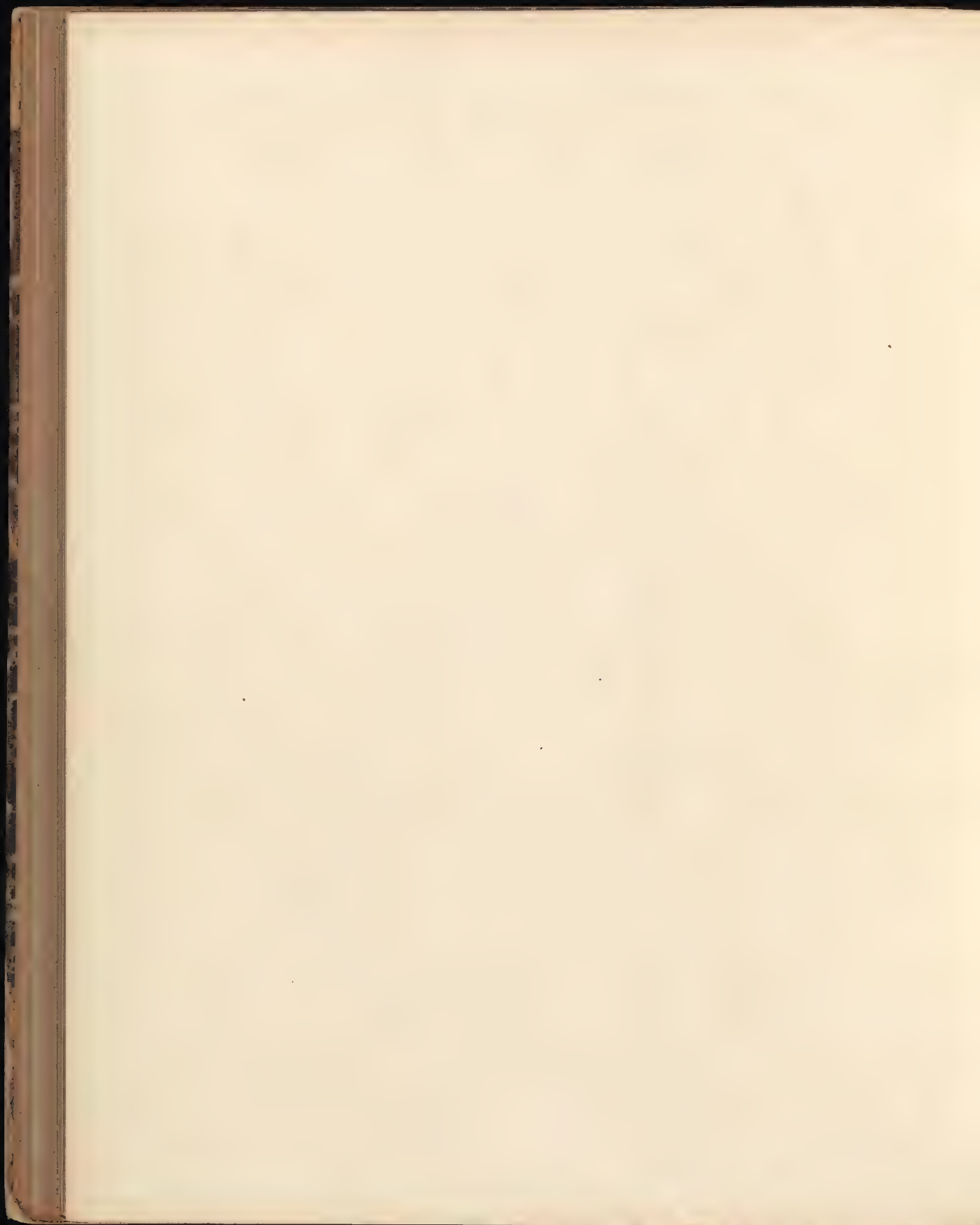
October 12th, 1886.

THE JOURNAL OF FABRICS AND TEXTILE INDUSTRIES.



EMINENT TEXTILE MEN.

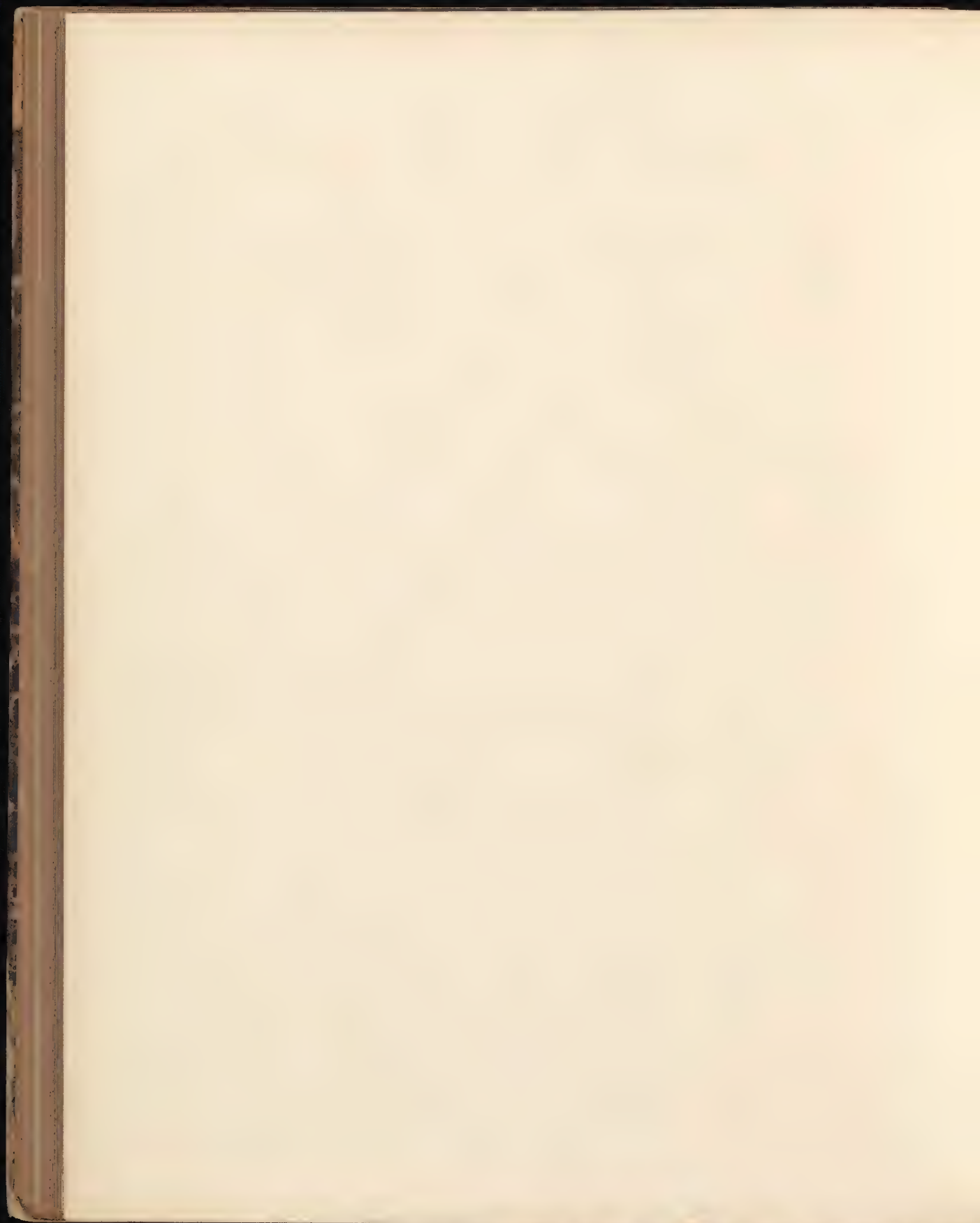
No. 5.—S. C. LISTER, Esq.







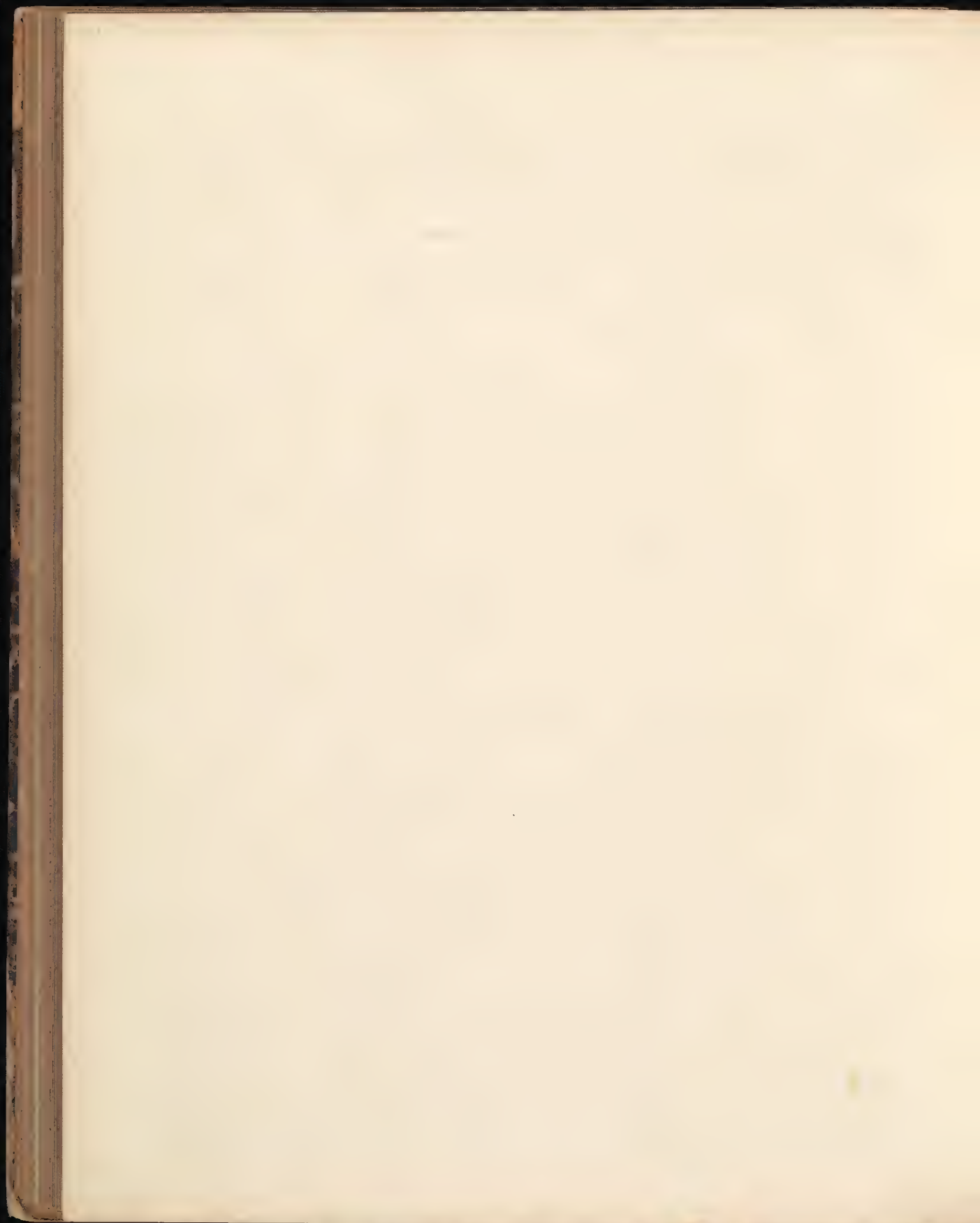
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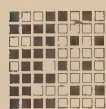




# ORIGINAL DESIGNS.

## Worsted Trouserings.

## No. 403. Warp:—



Design.

1 Lavender silk, 2/60's.  
 1 Blue " " 8 healds.  
 1 Lavender " " 80 ends per inch.  
 1 Blue " " 72 picks "  
 2 Dark Red worsted, 2/36's. 4 ends in a reed.  
 2 Black " " 20's reed.  
 4 Olive " " 64 inches wide in the loom.  
 4 Olive " " 56 inches wide when finished.  
 4 Black " " "  
 3 Light Drab silk, 2/60's.  
 1 Blue " " Straight Draft.  
 2 Dark Red worsted, 2/36's.  
 2 Black.  
 4 Olive.  
 4 Black.  
 4 Olive.  
 4 Black.

Finish clear and smart.

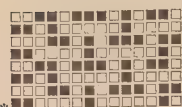
Weight about 18 ozs.

48 ends in pattern.

Woven all Black worsted, 2/36's. Silk must be warped and beamed on separate beam.

## No. 404.

## Warp:—



Design.

Straight Draft.

All Black left.

2 ends Black Angola, 10 skeins.  
 1 White worsted, 2/48's.  
 1 Stained Angola, 10 skeins.  
 1 Blue silk, 2/60's.  
 1 White worsted, 2/48's.  
 1 Black Angola, 10 skeins.  
 1 White worsted, 2/48's.  
 1 Steel "  
 1 Stained Angola, 10 skeins.  
 1 Steel worsted, 2/48's.  
 1 Crimson silk, 2/60's.  
 1 Black Angola, 10 skeins.  
 1 Steel worsted, 2/48's.

14 ends in pattern.

14 healds.  
 56 ends per inch. Woven 1 pick, 14 skeins woollen.  
 48 picks " 1 " 10 " Angola.  
 2, 6, 6 ends in reed. Finish clean and smart.  
 12's reed. Weight about 26 ozs.  
 62 inches wide in the loom.  
 55 " when finished.

Silk must be warped and beamed on separate beam.

## No. 405.

## Warp:—



Design.

Straight Draft.

Woven as warped.

6 Claret.  
 6 White. 80 ends per inch.  
 4 Bronze. 72 picks "  
 4 White. 4 ends in a reed.  
 20's reed.  
 64 inches wide in the loom.  
 56 " when finished.

Finish clean and smart.

Weight about 12 ozs.

2/60's worsted, viz., 16,800 yards to the lb.

32 White worsted ends for list each side.

## Woollen Suitings.

## No. 406.

## Warp:—



Design.

1 Brown, 2/18 skeins woollen.  
 2 Drab, " "  
 1 Black and Crimson twist, " "  
 2 Black, " "

All wool.

Woven as warped.

6 healds.

21 ends per inch.

Mill to width.

21 picks "

Finish clean and smart.

2 ends in a reed.

10½ reed.

Weight 24 ozs.

68 inches wide in the loom.

56 " when finished.

## No. 407.

## Warp:—



Design.

6 Stained. 6 healds.  
 6 Olive. 78 ends per inch.  
 6 Stained. 72 picks "  
 6 Black. 4 ends in a reed.  
 6 Stained. 19½ reed.  
 6 Olive. 66 inches wide in the loom.  
 6 Stained. 56 " when finished.  
 1 Orange.  
 4 Black. Finish clean and smart.  
 1 Orange.

2/36's worsted, viz., 10,080 yards to the lb.

Woven as warped. Straight Draft. Weight about 18 ozs.

## No. 408.

## Warp:—



Design.

2 Black, 14 skeins. Straight Draft.  
 2 White, "

Woven 3 picks Olive 40 skeins woollen, twisted to White 40 skeins woollen, forming one thread, 14 runs in an inch.  
 1 pick Orange and Crimson, made after same manner.

2,040 ends.

80 ends per inch.

Mill to width.

80 picks "

Velvet finish.

2 ends in a reed.

15's reed.

68 inches wide in the loom.

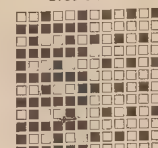
Weight about 20 ozs.

56 " when finished.

## Woollen Trousering.

## No. 409.

## Warp:—19 Black worsted, 2/40's.



Design.

1 Lavender silk, 2/90's organzine.  
 1 Black worsted, 2/40's.  
 1 Green silk, 2/90's "  
 1 Black worsted, 2/40's.  
 1 Crimson silk, 2/90's "

Straight Draft.

Woven:—12 picks, 20 skeins, Black woollen.

1 pick, " Green "  
 1 " " Black "  
 1 " " Maroon "  
 1 " " Black "  
 1 " " Maroon "  
 1 " " Black "  
 1 " " Green "  
 1 " " Black "

Finish clear and smart.

Weight about 22 ozs.

12 healds.

96 ends per inch.

64 picks "

6 ends in a reed

16's reed.

62 inches wide in the loom.

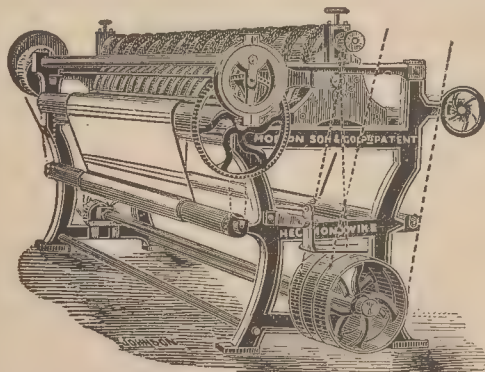
66 " when finished.

Silk must be warped and beamed on separate beams.

## MACHINERY \* TOOLS, \* & C.

### Morton's Patent Improved Raising Machine.

In the finishing of heavy woollen goods, various improvements have been made during the past few years, but there is none of greater utility than a machine patented by Messrs. Morton, Son and Co., machinists, of Heckmondwike. It is for the raising of the nap of blankets, rugs, and such like fabrics. It is superior in every respect to the old fashioned card raising machine, and should be in the establishment of every manufacturer of this class of goods. From the annexed illustration, a good idea of the various improvements can be had, and if compared with many machines of older date, its adaptability to its purpose will be apparent. To understand all its good points and its practical utility, it should be seen in actual work, and it would demonstrate clearly, to anyone interested in this class of mechanism, that it is the best apparatus for raising purposes now in the market. Every part of the machine is of solid workmanship, the cylinder runs in very strong carriages, which move backwards and forwards in slides, cut into the frames at the top and bottom of the carriages at each end. These carriages receive



their motion from eccentrics and strong connecting rods, fixed at each end of the breast shaft, which take the place of the small pins and light arms of the old gigs. The eccentrics give a regular and steady motion to the cylinder, and, as it moves on level slides, a perfect uniformity of raising is ensured, and a much lighter or heavier pressure on the piece can be made with good results. In the brush, an important improvement has been made. To the top of the cylinder carriage, a strong brush carriage, in which the brush runs, has been secured. This can be easily adjusted as required by means of a screw and hand wheel. The cylinder is of large diameter, and this coupled with the strength of the machine, causes it to run quicker, obtains more strokes per minute, and, consequently, a considerably greater quantity of work is got through. Altogether, the apparatus is worthy the attention of woollen manufacturers generally, as it will prove of decided advantage to them.

### The "Oldham" Boiler Fluid.

The question—how to keep steam boilers free from corrosion and incrustation has been one that has occupied the attention of practical men for some years past, and, in these days of advancement, various improvements, more or less successful, have been made to counteract the evil effects of the action of the various constituents of water upon the inside portion of the boilers. From time to time, we have described many compositions, which, by tests, have given very favourable results, and, in actual operation, have tended to reduce incrustation and corrosion to a minimum. The "Oldham" boiler fluid, made by Messrs. Eckersley Brothers, of Lees Road, Oldham, has gained a front position for the purpose for which it is intended. It has stood innumerable tests, of a very crucial kind, and the

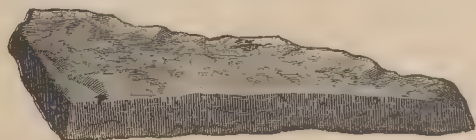


Fig. 1.

results have been most satisfactory. For use in new boilers, it is of the highest value, not that it removes incrustation from them, for the simple reason that it does not allow the formation of such substances on the plates, &c., whilst, in old boilers, the incrustation that has formed is so speedily acted upon by its use that it may be removed easily. Whilst performing this operation, it does not act upon the plates of the boiler, so as to cause

them to deteriorate, but it prevents them oxidising after the corrosion and incrustation have been removed. It quickly destroys organic matter, and neutralises detrimental mineral substances. The two illustrations show sections of scale taken out of boilers in Oldham. Fig. 1 represents a scale one inch thick at the front, and Fig. 2 a scale taken off rivets or bolts. The fluid had been used in both these cases. It is specially adapted for keeping open the feed pipes of engines, as it ensures perfect cleanliness. Judging from the number of recommendations from steam users in nearly all branches of trade, those who purchase for the first time are sure of obtaining an article in every respect highly satisfactory. Messrs. Eckersley have published a pamphlet which enables those interested to judge of the capabilities of the "fluid." It gives the results of various tests, and, also,

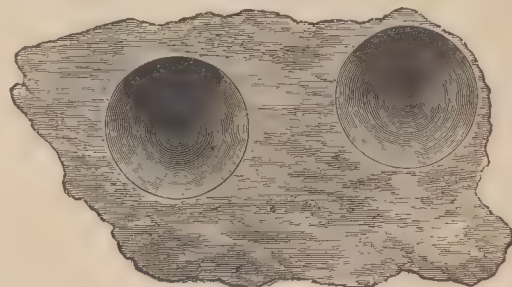


Fig. 2.

a number of testimonials, which at once stamp it as being in the van of such necessities for steam users. It would take up too much of our space to give extracts from these reports, and we would, therefore, urge our readers to procure the pamphlet from the above firm, and then to judge for themselves of the value of the commodity by purchasing a trial cask, particulars of which will be found amongst our advertisements.

### Technical Education Congress.

The *Times* correspondent says—"An International Congress on technical education, commercial and industrial, was opened recently at Bordeaux. The Ministers of Commerce, Public Works, and Public Instruction sent representatives to the meeting. There were also present delegates from England, Belgium, Russia, Switzerland, Italy, Servia, Roumania, Spain, Portugal, &c. At one of the meetings, Sir Philip Magnus, President of the Technical Institute of London, read a paper on Technical Education in England. He stated that the English are no longer so dependent as they were on Parisian artists for industrial designs, and that they now, almost exclusively, employ English draughtsmen in manufacturing lace, carpets, wall-papers, curtains and furniture. M. Roy, the delegate of the Chamber of Commerce of Paris, replied to these statements. He admitted that, in consequence of the very meritorious efforts of associations and private persons, the production of articles of luxury had made great progress in England, under the direction of Parisian managers, tempted to cross the Channel by the attraction of high salaries. But much was still wanted to elevate the taste of the English to the French level. Especially with regard to tissues, Lyons, Saint Etienne, Rouen, and Roanne maintained an uncontested superiority. It should, however, M. Roy added, be admitted that English competition was in the main a fair one. The case was quite different as regarded German competition. The English strove to equal the French by improving their methods and getting their work done by good men. The Germans purely and simply appropriated French patterns, and reproduced them in inferior goods, which they sold as French products. M. Roy had no hesitation in stating that, as regards the greater number of products, France could manufacture more cheaply than England, and with the same cheapness as Germany. The Germans and the English were spreading reports everywhere that the French could not manufacture cheaply. They knew better than anybody that this was a complete error. But they also knew that the best means of closing the markets against rival manufacturers was to say that the goods of the latter were dear. By dint of hawking about this calumny, in all directions, Europe had begun to believe it, and the error had even taken root in France."



## Foreign Trade Reports by Her Majesty's Consuls.

Consul-General Blunt, writing from Salonica, Turkey, says:—On the whole, the demand for cotton, woollen, and silk manufactures, especially yarns and piece goods, was well sustained in 1883 and 1884. By far the largest quantity of yarns is imported direct from the United Kingdom. The counts chiefly in demand are Nos. 12/14, 16/24, 30/32, and 40/42. The native cotton factories, of which there are now two in Salonica and one at Mausta (Augusta), in the interior, are beginning to compete successfully with the lower counts of foreign yarns. They turn out annually about 140,000 packets of 10 lbs. each. The yields of 1883 and 1884 wool were good: France, which generally drew large supplies from Salonica, took hardly any in 1883. The decrease in the exports in 1884 was owing to the extension of native industries for the manufacture of coarse cloth for the army, and of carpets and other articles for local consumption. Average price 5d. per lb. The production of cocoons was fairly abundant in 1883 and 1884, showing that the breed of silk-worms has, in a great measure, recovered from the disease which affected it so long. Most of the yield in both years was exported to Italy at 4s. 4½d. per lb. The cultivation of cotton in Macedonia is being steadily extended, owing to the establishment of cotton mills. The crop of 1883 was above the average, both in quantity and quality, but that of 1884 proved very short, owing to an untoward season. Average market price, 4½d. per lb. There are two cotton mills in this town—one set up in 1879 and the other in 1884-5. They employ 800 operatives, and turn out 120,000 packets of twist annually. They have proved a success, as raw cotton is at hand, and the consumption of yarn is extending in Macedonia and Albania. There are also a few small iron foundries in the place, but they cannot meet the wants of the industrial classes. I have no doubt that in view of the progress of manufacturing industry in this and other towns in Macedonia, the establishment of first-class iron works in Salonica, at which machinery could be thoroughly repaired, would prove a profitable enterprise.

DIARBEEKIR.—Mr. Vice-Consul Boyajian reports as follows:—Though trade in Diarbekir was, during the early months of the year, much depressed, and a considerable falling-off in every section was at first apprehended, a reaction set in later on whereby the total value of all traffic amounted to £258,554, being £16,736 in excess of the value for 1884; so that, taking into consideration the present impoverished state of this province, the past may be reckoned a fairly prosperous year. Notwithstanding the general reduction in price (averaging 10 per cent.) on all the articles of import, still the value of goods imported from Europe exceeded that of 1884 by £2,255, and, including those from various parts of Turkey, the total increase would be £6,225. Hence it may be inferred that the quantity of goods imported during the past year was much larger than that of the year before. The demand for such articles as yarns, calico, and prints remained stationary, prices fell, and the quality of these articles was somewhat inferior, but the volume consumed was almost the same as in 1884. The increase of manufactured woollens consists almost entirely of a cheaper quality of kerseymeres and flannels, imported chiefly from Austria, and consumed by all classes of the people.

Consul-General Perry, writing concerning a visit to Kieff, says:—It has been most difficult to obtain information of any kind as to imports, for there are no English merchants engaged here in trade, except the representative of a large machinery and agricultural implement establishment. I was therefore enforced to collect data from various sources. Our manufacturers ignore the wishes of the consumers, and naturally other countries step in and supply what is wanted. In corroboration of this statement, I will quote the words of a correspondent from Warsaw, an Englishman, who is a boiler maker. He says: "In former years we imported our iron from England exclusively; but owing to the stiff-necked dealings of our countrymen, we transferred our custom to Westphalia, and find that the Germans are much more obliging, easier to deal with, and they supply us with a material equal to the best English at a cheaper rate. The real truth lies thus, the Germans, by means of commercial travellers, look after and study the wants of their customers." English goods, from what I can see, are thought well of here,

which is said not to be entirely the case at Odessa, as far as I can judge, and from what I hear, there is an opening in the district for English articles. But to take advantage of this, I should say that the first step to be taken by English manufacturers would be to send out English travellers, or agents, to see what is in demand. I hear that several English houses have employed Germans as travellers, and that these persons have by degrees transferred the business they have collected together to their own countrymen.

BATOU.—Acting Consul-General Stevens writes to the Earl of Rosebery, from Odessa, concerning the trade of Batoum, to the effect that the bulk of wool, as well as raw silk and cotton, are purchased in the interior, in districts lying between Tiflis, and are principally shipped to France. With regard to British commerce in particular, I must again repeat that the absence of English merchants at this place, whilst the number of foreigners establishing themselves on the spot yearly increases, is unquestionably one of the main reasons that other nations, especially Germans, are more successfully extending their trade in this locality than we do.

PORTUGAL.—ST. MICHAEL'S.—Mr. Vice-Consul Dart reports that the trade with Great Britain is much affected through foreign competition. Cotton goods under the heads of grey domestics, and white shirtings, have been driven out of the market by American goods, being superior in quality and lower in price.

GREECE.—THE PIRÆUS.—The depression of trade and industry at the Piræus and Athens, during the years 1884-85, has been unprecedented, but does not appear to have seriously affected British trade with this port in particular. This depression commenced in the beginning of the year 1884, with a severe financial and commercial crisis, which, up to the present time, shows few signs of amelioration or abatement. The primary causes of this were, undoubtedly, due to reckless speculation and gambling in stocks and shares, building plots, &c., which prevailed here during the preceding three years, namely, from 1880 to 1883, and which was increased by the natural inflation of prices caused by a large issue of inconvertible notes of the National Bank, to which forced currency had been given by the Government in 1887. Cotton twist, once considered one of the staple imports from England, is at present produced in sufficient quantities at the spinning mills established at the Piræus, not only to supply the local demand, but also that of the neighbouring provinces of Turkey. The machinery used in these factories was made in England, and put up by skilled workmen, brought for that purpose from Manchester, who remained here until they had taught the native workmen, when their services were dispensed with. As regards hardware and articles of this description, English goods are nowhere; they are very seldom imported; the German goods are cheaper, and though somewhat roughly made, answer every purpose. In fact, judging from what is taking place on a small scale in Greece, the trade of the Levant appears to have passed from Englishmen to foreigners. The old English Levant houses have disappeared, and British enterprise with them. The truth is, the French, Germans, and Italians adapt themselves more easily to their foreign surroundings than Englishmen, who, as a rule, expect foreigners to submit to them, and be guided by their fixed methods of doing business, without which no transactions are thought possible.

## Commercial Failures.

According to *Kemp's Mercantile Gazette*, the number of Failures in England and Wales gazetted during the four weeks ending Saturday, September 25th, was 363. The number in the corresponding four weeks of last year was 324, showing an increase of 39, being a net increase, in 1886, to date, of 274. The number of Bills of Sale published in England and Wales for the four weeks ending Saturday, September 25th, was 973. The number in the corresponding four weeks of last year was 919, showing an increase of 54, being a net increase in 1886, to date, of 360. The number published in Ireland for the same four weeks was 61. The number in the corresponding four weeks of last year was 70, showing a decrease of 9, being a net increase, in 1886, to date, of 133.





### German Enterprize in Trade Matters.



THE Germans seem, at the present time, to be putting forth their utmost energies in order to secure the lion's share of the world's trade in nearly all departments of industry. Only a comparatively few years ago, they were far behind this country in most branches of trade, and were not considered a manufacturing nation. Formerly, vast quantities of goods, of various kinds, were exported from this country to the States now comprising Germany, and it was the furthest thought of an Englishman that their Continental neighbour would, in so short a time, run this country such a race as she is at present doing. But Germany, especially since the Franco-Prussian war, has put such an amount of spirit into her industries that now she may be considered the most formidable rival we have to contend with, or, at least, may be classed with France as such. We have heard, and are continually hearing, much of her rapid advance in technical education, and of the various means she adopts to increase her trade and commerce, and we have not failed to take thoroughly to heart many of the lessons so taught, which lessons have tended to make our producers of various classes of goods look more to the wants of customers than they did formerly, and this is not being done a moment too soon, as we find the Germans continually launching some new project to further their own interest, both at home and abroad. We have said much formerly on the question of their productive tariffs, and probably may have more to say in the future, but our object at present is to draw the attention of those specially interested to the last new project they have in hand. Only recently we heard of them sending out to foreign countries "floating warehouses," containing an infinite variety of goods, mostly manufactured in Germany. These vessels were to call at certain ports to attract the notice of merchants, and to endeavour to secure their patronage in the future. This is a step undreamt of before, and one which has been attended with a certain measure of success, and is likely to increase the volume of trade between Germany and the ports at which the vessels call. The project now on foot is the suggestion of a German professor, Herr von Kaufmann, and is meeting with much favour in the Fatherland. The proposal is one involving large consequences, for it is none other than the establishing of a Customs Union for the whole of Central Europe—a German Zollverein upon a gigantic scale. A contemporary writing upon the project says:—"There is something grand, wise, and imposing, about the scheme which fires the imagination. You begin to dream of the unity of peoples, of half-a-dozen antagonistic nations peacefully exchanging their merchandise, of the abolition of war once and for ever. It is highly improbable that the idea will be carried into execution, at all events within the next half century; yet there is much to say for it from many points of view. That the difficulties of working such a scheme, although they are admittedly great, are not insurmountable was proved when the German Zollverein was formed. A Customs Union is, on the face of it, a very different thing from a Postal Union; for example, the interests involved are much more serious, and they include questions of policy, upon the solution of which the entire material prosperity of a country may depend. Complete and perfect free trade between the countries of Central Europe would open up to each of the contracting States a market of 130 millions of consumers, which could never fluctuate by reason of tariff changes. It is obvious that traders who had so considerable a market for their goods would have comparatively little to fear from the protectionist policy of countries not included in the Union. Equally is it obvious that such an agglomeration of States would occupy a far stronger position

in relation to protectionist countries than any single nation could possibly occupy. The idea that the revenues of the contracting States would suffer from the operation of such a Customs Union is not warranted by the experience of the Zollverein. Increase of trade means increase of revenue, and that the volume of international commerce would expand in presence of the facilities which would thus be afforded it, there can be little doubt. But the fact remains that the existence of an international Customs Union, confined to the States of Central Europe, would work enormous harm to British commerce; and it is conceivable that, in such circumstances, the only method of safeguarding our commercial interests would be a recourse to protection. It seems improbable that even an international Zollverein, embracing 130 millions of people, would be able to look with equanimity upon the serious check that would be caused by the practical closing of the markets of the United Kingdom. There would thus be some safeguard against the danger which might threaten of the conversion of the Union into a great protective institution as regarded all States which did not form part of it. Herr Von Kaufmann's dream is a very pleasing one, and its visionary nature is well calculated to please the German mind, which has a natural love of all abstractions. The scheme is, moreover, quite workable; but it is too cosmopolitan, and demands for its accomplishment the effacement of so many national dislikes and jealousies that it is, in the highest degree, unlikely to become a concrete thing, at all events, until the times become somewhat more transcendental. In the light of recent events in foreign policy, the present is a very bad time to ask the world to support a scheme for the commercial regeneration of Europe, or to do any other act which shall go any considerable distance towards making war impossible. Identity of material interests undoubtedly forms the strongest bond of friendship between nations; and, if war should ever become a matter of purely antiquarian interest, it is conceivable that so highly desirable a consummation may be very largely brought about by the multiplication and intertwining of international commercial interests. Herr Von Kaufmann's scheme is clearly born of the strong German desire to supplant England in the markets of the world, and, if the new Zollverein were established, there can be little doubt that it would be used, not only to the disadvantage of England but, to the sole advantage of the Fatherland. Our Teutonic cousins must beware lest it be said of them, as of their neighbours, that in matters of commerce they give too little and ask too much."

### The Saltire International Exhibition of Art, Science and Industry.

The prospectus of the above exhibition has been issued, along with the application forms for space, &c. Judging by particulars, the project is to be on an extensive scale, and it is to be hoped that success will attend the efforts of the promoters, as the object is one well worthy of the patronage of all who are interested in the general welfare of the people of the Saltire district. The prime objects of the exhibition are to afford the great population of the manufacturing districts of the West Riding of Yorkshire, and the North of England generally, an opportunity of studying examples of the best work yet achieved in the several departments of Art, Science, and general Industry, and to assist in defraying the cost of the new Art and Science School, and in forwarding the general work of the Salt Schools. To give a general outline of the great benefits conferred upon the Saltire district by the late Sir Titus Salt, Bart., would take up too much of our space, and would only be a repetition of what is well known by the present generation. The exhibition, an illustration of which is given on the third page of advertisements, will be International, and exhibits from all countries will be admitted, and a leading feature will be made of Textile exhibits. It will be open for about six months, from May 3rd, 1887. Diplomas, First, Second, and Third Class, will be awarded to exhibitors. Prospectuses and forms of entry for exhibits, can be had of Mr. William Fry, Secretary of the Exhibition, Saltire, Bradford, Yorkshire.



### Wool Clip of New South Wales.

British pastoralists may be enabled to form some idea of the magnitude of the wool-growing industry in New South Wales from the following figures—In 1885, the number of lambs shorn in the grease was 4,113,383, the number washed 42,584; making a total of 4,155,967 lambs shorn. The number of sheep shorn in the grease was 28,324,595; hot water and spout-washed, 38,000; creek-washed 642,424; and scoured, 267,250. In thirty-six districts the clip was reported as good and sound, in four districts, poor and unsound, in three districts, light but sound, and in the remaining districts, fairly sound but wanting in yoke. The total clip in the colony for the year 1885 (according to the number of sheep) would be 28,324,595 sheep shorn in the grease average clip, 5lbs. 7½ozs. per sheep, equals 154,900,128 lbs.; 38,000 sheep, hot water and spout-washed, average clip, 3 lbs. 4ozs. per sheep, equals 123,500 lbs.; 642,424 sheep, creek-washed average clip, 3lbs. 2ozs. per sheep, equals 2,007,575 lbs.; 267,250 sheep, scoured, average clip, 3lbs., equals 801,750 lbs. Lambs: 4,113,383 lambs, shorn in the grease, average clip, 1lb. 12ozs. per lamb, equals 7,198,420 lbs.; 42,584 lambs, washed, average clip per lamb, 1lb. 8ozs., equals 63,876 lbs. Total clip, 165,095,249 lbs.

### Technical Education in India.

The Bombay Government is addressing itself seriously to the subject of technical education. In a long resolution just issued, it has laid down the outlines of the scheme which it favours under three heads—agriculture, art industries, and mechanical industries. It proposes that the College of Science at Poonah should be a central institution for the teaching of higher agriculture, and that local classes and schools should be established throughout the province under the supervision of district officers, and of the educational department. The Jamsetjee Jeejeebhoy School of Art in Bombay is to be the centre of Government efforts for the purpose of art teaching, and a report is called for as to the propriety of obtaining additional teaching. The question whether a technological institute for mechanical industries should be established is discussed at some length, and the Government expresses the opinion that the time for doing so has not yet come. Meanwhile, it is suggested that the committee of the Ripon Memorial Fund should form itself into an association for promoting technical education in Bombay city, the Government promising to give it the utmost possible aid. The main dependence of other parts of the province must be upon the high schools for elementary science and upon such institutions as may be started by means of local efforts. The Government concludes by saying that the scheme is not academic, but that it is meant to enhance the well-being of the people at large by giving increased employment to labour and capital and by cementing harmonious relations between them.

### The Bankruptcy Laws.

The Board of Trade have issued their third annual report on the working of the Bankruptcy Act of 1883. The general results during the past year appear to be of a very satisfactory character. The amount of insolvency brought under official review, measured by the aggregate liabilities, continues to diminish, although there is a small increase in the number of cases as compared with the previous year. The proportion of assets to liabilities is also better, and the collection and distribution of assets have been effected at a considerably lower percentage of cost than under the Act of 1869. It is also useful to note that the percentage of cost, in the case of estates administered by officials, is smaller than in the case of estates of similar amount administered by non-official trustees. The aggregate loss to creditors by insolvency has, on the whole, decreased, and there is reason to believe that this decrease is largely due to the operation of the Act. The report, however, admits that much has yet to be done as regards the exposure and punishment of fraudulent and reckless trading. A stringent administration of the Act against fraudulent debtors

appears to be well received by the trading public, and in the places where it has been most stringently administered, and where the co-operation of the official and judicial staff has been most complete, the co-operation of the Act has been both successful and popular. Proposals to infringe the spirit of the Act by re-introducing private arrangements, framed for binding a recalcitrant minority, have been rejected with the full approval of the trading classes. Various proposals for amending the law and its administration have been urged upon the Board of Trade.

### Tunis Cotton Manufactures.

By the direction of Lord Iddesleigh, Sir P. V. Lister, K.C.M.G., of the Foreign Office, has forwarded to the Manchester Chamber of Commerce, a copy of a despatch received from Mr. Thomas B. Sandwith, C.B., Her Majesty's Consul at Tunis, together with cotton-stuffs produced in that city and elsewhere in his consular district. The specimens to which Mr. Sandwith draws attention, and which can be seen at the Chamber of Commerce, in Booth Street, consist of twelve pieces of cotton-stuff, the production of the hand looms of Tunis and its neighbourhood, besides one piece imitated in Switzerland. No. 1 is a red-and-white striped cloth, which bears the name of *Kasta*. It is made 4 yards and 16 inches long, and 27 inches in width, and is much in vogue, being used as a turban. The price is 2s. 2d. No. 2, the *Foota*, is a piece of coloured cotton-stuff, with which the native women envelop themselves from the waist to the knees. It is 1 yard 32 inches long, by 1 yard 3 inches wide. *Footas* are exclusively of Tunisian manufacture, and are largely used. Price, 1s. 4d. No. 3.—Specimens of the same kind, but of different design, and in both cases the warp is uniformly of cotton, dyed turkey-red, while the woof is of different colours. Price, 1s. 4d. Nos. 4, 5, and 6, represent what are called in Tunis *Dreri*; in the singular *Deraya*. The other specimens sent represent the designs most in fashion. Their length is uniformly 3 yards 6 inches, by 18½ inches in width. *Dreri* are manufactured exclusively in Tunis, at 64d. per piece. No. 7, a *Melia*, is a kind of fustian of coarse cotton, much in use among the Bedouin women, who make it their principal garment. The piece sent is formed of two *Melias*, of 4 yards 4 inches long, by 28½ inches wide. The *Melias* are made at Tunis, and at Sfax, and have a considerable sale. They cost 2s. a piece, or 4s. for the two. Nos. 8, 9, 10, and 11, are towels such as are used at the bath. They are manufactured exclusively at Sfax, and find their way to Algeria in considerable quantities. No. 12 is a very light texture, called *Morali*, being an imperfect imitation of a similar tissue manufactured in the Morea. It measures 19 yards 29 inches long, by 16 inches wide. It is used for making shirts, is manufactured exclusively in Tunis, and sells at 3s. 4d. the piece. The above quotations are wholesale prices, after the payment of duty and freight on the twist. The retail prices allow a profit of five per cent. to the vendor. All the above tissues are made of English cotton twist, and are dyed at Tunis, with the exception of the turkey-red dyeing, which is done in Germany, Switzerland, and Belgium. Should the manufacturers of Lancashire undertake to imitate any of the above tissues, it is important that the imitation should be as close as possible as regards the quality of the stuff, the dimensions and the dye, and that the folding should be the same. Above all, it is essential that no size should be introduced. Mr. Sandwith also sends a copy of Mr. Vice-Consul Leonardi's report on the manufactures of Sfax, together with specimens illustrating his report, which also can be seen on application at the Chamber of Commerce offices.



### ODDS AND ENDS.

The first meeting of the Gold and Silver Currency Commission was held at Richmond Terrace, Whitehall, London, on the 12th October, when the general procedure of taking evidence was arranged.

Messrs. Heriot and Co., Paris, proprietors of the Louvre and hotel of that name, have subscribed a sum of £25,000 to the guarantee fund of the Universal Exhibition of 1889, twenty thousand for the Magasin de Nouveautés, and five for the hotel.

The United States Consul at Mexico states that the textile fibre, extracted from the Lechuguilla plant, which grows wild in some mountainous districts of that country, and which is exported in the raw state, is much used in both America and Europe in the manufacture of imitation Brussels carpet, ladies' corsets, sacks, mats, cordage, &c.; it is also employed instead of hog bristles for brush making.



### Receiving Orders.

- Buckley, W. (trading as Isaac Buckley and Sons), Ravens Wharf, Dewsbury, Yorkshire, worsted and yarn spinner.  
 Chartres, J. (trading as Thomas Chartres and Sons), Littlewood's Buildings, Huddersfield, woollen cloth merchant.  
 Thornley, J., Perry's Factory, Radford Boulevard, Nottingham, formerly trading with T. S. Clarke, as Thornley and Clarke, at 40, Bow Lane, London, lace manufacturer.  
 Waddington, R. (trading as Kippax and Waddington), Netherfield Shed, Nelson, Lancashire, formerly trading with Nehemiah Kippax, worsted manufacturer.  
 Wright, G., and Browne, J. R. (trading as Wright and Browne), 21, Player's Factory, Nottingham, lace manufacturers.

### Adjudications of Bankruptcy.

- McAnultz, S., 55, Egbaston Street, Birmingham, woollen merchant.  
 Thornley, J., Perry's Factory, Radford Boulevard, Nottingham, formerly trading with T. S. Clarke, as Thornley and Clarke, at 40, Bow Lane, London, lace manufacturer.  
 Wright, G., and Browne, J. R. (trading as Wright and Browne), 21, Player's Factory, Nottingham, lace manufacturer.  
 Waddington, R. (trading as Kippax and Waddington), Netherfield Shed, Nelson, Lancashire, formerly trading with Nehemiah Kippax, worsted manufacturer.

### Dividends.

- Holmes, D., Holme Top Mill, Little Horton, Bradford, worsted spinner, rs. 33d. (first and final), Official Receiver's Chambers, 31, Manor Row, Bradford.  
 Wyld, J. L. (separate estate), St. Peter's Mill, Park Lane, Leeds, Yorkshire, woollen manufacturer, trading with Harry Blaxland, as Wyld and Blaxland, 20s., 32, Park Row, Leeds.

### Dissolutions of Partnership.

- Hill, W., and Hill, S., Long Eaton, Derbyshire, lace manufacturers.  
 Milne, J., and Milne, S., 3, Butterworth Street, Rochdale, Lancashire, wool merchants.  
 Sterne, A., and Wimpfheimer, A., 18, Exchange Buildings, Liverpool, cotton merchants.  
 Thomas, A. N., and Harrison, T., 25, Noble Street, London, silk manufacturers.  
 Wragg, W., Husbands, G., and Wragg, R., Long Eaton, Derbyshire, lace machine builders.

## PATENTS.

### Applications for Letters Patent.

- Arrangement, construction and actuation of lubricators. W. H. Thompson, Lewisham. 21st Sep. 11,996  
 Apparatus to dispense with the long check strap for looms. T. Knowles, Halifax. 23rd Sep. 12,096  
 Burning hydrocarbon or mineral oils or other such liquid fuel in steam boiler and other furnaces, and apparatus therefor, also applicable for other heating and lighting purposes. J. Neil, Glasgow. 10th Sep. 11,538  
 Batching jute. E. Heuman, London. 21st Sep. 11,986  
 Cotton waste pickers. J. P. Hillard and W. H. Goldsmith, London. 31st Aug. 11,096  
 Chenille fabrics. J. Lyle, Glasgow. 1st Sep. 11,141  
 Circular knitting machines. E. Newton and A. C. Smith, London. 11th Sep. 11,562  
 Cleansing composition for linen or cotton fabrics or yarns, for use in bleaching. A. Hodgkinson, Ballyclare. 21st Sep. 11,981  
 Drawing, slubbing and intermediate frames for preparing cotton, &c. J. Dugdale and G. Haworth, Manchester. 1st Sep. 11,118  
 Dyeing and finishing textile fabrics simultaneously, without immersion. W. E. Heys, Manchester. 2nd Sep. 11,164  
 Dobbies for looms. W. H. Teague and J. Eccles, Halifax. 9th Sep. 11,446  
 Decorticating and combing hemp and flax. H. J. Haddan, London. 18th Sep. 11,886  
 Fire extinguishing composition. E. A. Brydges, London. 30th Aug. 11,026  
 Figured cloth. D. Greenhalgh, London. 30th Aug. 11,033  
 Finishing cotton, linen or union cloth, grey, bleached, dyed or printed. M. Hilton, Prestwich. 3rd Sep. 11,207  
 Fancy cloth looms. E. Edwards, London. 3rd Sep. 11,237  
 Fustians and cords. W. Wilcock, Halifax. 10th Sep. 11,510

- Grooved pulleys. E. P. Baville, Liverpool. 10th Sep. 11,533  
 Gas engines. A. J. Boulton, London. 11th Sep. 11,576  
 Guiding fabrics into stentering, breadthening, beaming, and other similar machines. D. P. Smith, London. 21st Sep. 12,036  
 Indicating speed of revolution of parts of machinery. T. F. Walker and J. G. W. Fairbairn, London. 13th Sep. 11,610  
 Jacquard apparatus. J. Hall and P. Pearson, London. 30th Aug. 11,031  
 Jacquards or dobbies for looms. J. Wild, Halifax. 7th Sep. 11,342  
 Jacquard dobbies. W. P. Uhlinger, London. 7th Sep. 11,368  
 Jacquard looms. J. Watson, Manchester. 16th Sep. 11,765  
 Knitting fabrics. J. W. Lamb and S. Lowe, London. 2nd Sep. 11,191  
 Knitting machines. B. Kerr, London. 22nd Sep. 12,072  
 Looms. W. Warrington, Manchester. 10th Sep. 11,516  
 Loose reed and warp letting off motions and apparatus for turning back the cloth roller. C. Catlow, Halifax. 15th Sep. 11,700  
 Looms for ornamental fabrics. R. A. Whyttan and J. Kincaid Glasgow. 17th Sep. 11,818  
 Method of and apparatus for bleaching, damping and dyeing loose fibre, yarns, threads, &c. E. and G. E. Sutcliffe, Halifax. 27th Aug. 10,933  
 Mechanism for throwing belt driven machinery into and out of action. J. A. A. Buckholz, London. 27th Aug. 10,966  
 Measuring fabric, to be designated a trimming and cloth measuring machine. T. Murphie, Glasgow. 30th Aug. 11,019  
 Moving buffer belonging to a weaving loom, the present buffer being motionless, the moving buffer being an improvement on account of the picking stroke of weaving loom being broken by moving to and fro. W. Craven and J. Fielden, Todmorden. 8th Aug. 10,402  
 Means for the proper retention of the inoperative weft threads of looms in which several shuttles are used. J. Bairstow, J. B. Spencer and S. Midgley, Cross Hills. 14th Sep. 11,639  
 Means of fastening tapes for spindles, &c. J. Wilson, Halifax. 21st Sep. 11,008  
 Operating heads of looms. J. S. Loynd and H. Smalley, Halifax. 1st Sep. 11,110  
 Oil-cans. H. Lucas, Birmingham. 9th Sep. 11,443  
 Oven for drying raw cotton, &c., chiefly for testing purposes. D. Hall, J. H. Kay, and T. Wagstaff, Manchester. 13th Sep. 11,601  
 Operating the shuttle boxes in drop box looms. R. Hall, Manchester. 16th Sep. 11,759  
 Oil-can. J. Lee and G. Flood, Birmingham. 20th Sep. 11,932  
 Preparing cotton, &c. W. H. Richardson and T. R. Marsden, Manchester. 31st Aug. 11,103  
 Picking apparatus. P. Sutton, Manchester. 14th Sep. 11,643  
 Picking bands. J. R. Hutchinson, B. Turton and C. Heywood, Manchester. 14th Sep. 11,645  
 Printing on fabrics. J. Kerr, London. 18th Sep. 11,890  
 "Streamers" or "jack straps" for looms. J. Watson, Manchester. 1st Sep. 11,111  
 Spindles and wires for winding machines, jacking-off machines, and bobbin boards. E. Reavill, London. 1st Sep. 11,129  
 Shuttle-actuating and head operating mechanism of looms. R. L. Hattersley and J. Hill, Keighley. 21st Sep. 11,980  
 Shuttles for looms. S. Hainsworth, Bradford. 22nd Sep. 12,080  
 Thread guides and mountings. S. Tweedale, Halifax. 27th Aug. 10,932  
 Tubes and bobbins for textile machinery. S. Wilson, Dublin. 3rd Sep. 11,209  
 Treatment of cocoons of silk preparatory to unwinding the silk therefrom. E. Donner and E. Corsel, London. 16th Sep. 11,795  
 Tentering machines for finishing cloth. M. Stubley, Halifax. 18th Sep. 11,872  
 Velvets and other pile fabrics, and apparatus therefor. F. H. Wilke, Bradford. 3rd Sep. 11,212  
 Weft-fork mechanism for stopping looms. W. C. Priestley, Halifax. 7th Sep. 11,357  
 Washing wool and apparatus therefor. E. Tremsal and A. Dictus, London. 7th Sep. 11,370  
 Warp-beams for looms. T. Burns, J. Fowler, and A. Akeroyd, Bradford. 8th Sep. 11,420  
 Weaving two pieces of fabrics face to face connected by pile threads, and sewing these. J. C. Mewburn, London. 20th Sep. 11,946

### Patents Scaled.

9,769	10,099	10,227	10,338	10,486	10,549	11,124
11,319	11,640	13,361	15,099	5,665	6,348	6,368
6,714	7,920	8,724	9,192	9,722	9,996	10,138
10,439	10,764	10,784	11,201	11,444	5,668	6,665
6,884	7,816	9,631	10,012	12,407	2,817	6,299
7,032	7,063	7,075	10,319	10,520	11,152	7,427
8,160	9,129	9,190	10,590	11,189	11,368	11,772
12,156	12,406	4,030	6,041	6,371	6,504	6,673
7,242	7,254	7,388	7,389	10,408	10,521	10,756
10,795	10,999	7,505	7,528	7,663	7,666	10,582
10,715	11,420	11,635	12,534	7,091	7,710	7,804
12,659	7,937	7,995	7,999			



# The Journal of Fabrics AND Textile Industries.

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## Notices.

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## Indian Silk Culture.

Being a Paper, on the Silks in the Indian Silk Culture Court at the Colonial and Indian Exhibition, read in the Conference Room on the 24th of June, 1886, by THOMAS WARDLE, F.C.S., F.G.S.

(Continued from Page 37.)



HAVING convinced myself, by lengthened microscopical study of the structure of Bengal and other cocoons, of the wonderful regularity in which the silk-worm deposits its silken thread, I felt that the fault did not lie with the worm, but in the earliest stage of manufacture, that of reeling or unwinding the silk from the cocoon. I have had many opportunities of observing silk-reeling, in both France and Italy, for many years past, and I felt that if the same care and appliances were used in India as in these countries, silk of proper quality could be obtained. In that I perfectly succeeded, and in no case in India was it told me that an improved thread was not the result, in every case it was admitted. The use of the little tavelette made the difference. It is simplicity itself, but a simplicity which is the result of prolonged experience and skill. It helps better than any other method I know of to unwind the cocoon regularly and straightly. It is the offspring of the skill of an Italian named Consono, and it is known in Italy as the Tavelette Consono, and is more or less the system of reeling in Italy and France; therefore I am not advocating it as any particular or pet form of instrument; still less must it be considered that I have any but a scientific interest in it; I am not its agent or protector; it passes into my *Pot-à-feu* of disinterested work in sericulture for India's good alone. I will

pause here to consider an objection or two. No effort is ever made at improvement without creating objections and objectors. I anticipated these. I had not had my Tusser experience for nothing. For years, at first, I heard nothing but objections and prejudices against the utilisation of Tusser silk, some of which ceased only when the objectors found they could object no longer. I know I may be told that although this system of reeling yields a better thread of raw silk, the cost of reeling is increased, and that with the present competition it will not pay. I will answer this objection in several ways. First, the fault, which I do not admit, lies in the competition and not in the machine. Second, I am not disposed to admit that it would be wise to sacrifice any improvement that can be made in quality because the value of the raw silk is enhanced thereby. When I was in Bengal, the price of good reeled silk was 11s. per lb., now it is 14s. 6d.,\* and this is more than the proportionate increase as compared with the rise of prices of other silks, this excess over others being simply the result of improved reeling, whether with the tavelette or not is of no importance to my argument. Third, I am certain that if the Italians ceased to use their tavelette, and adopted the one I found in use in India, their silks would at once become of less, probably much less, value in the market. They hold their remarkable values, some 6s. per lb. over and above Bengal silks, in a great degree to the beautiful way in which they are reeled. In fact, it is possible to buy badly reeled Italian silks at 14s. 6d. per lb. or only a little more. Fourth, I was informed in one large Bengal filature that the cost of reeling by this European method would, in all probability, be little or nothing in excess of the old method as soon as the reelers had familiarised themselves with its use. I have received a letter from Mr. Morey, of the well-known Surdah Filature, in which the following remarks occur:—"I have reeled some 10/11 deniers and 25/30 deniers by your European method, and highly approve of it. In fact, I am going to reel several bales to test the market. You will be pleased to see the 25/30 deniers, which is a very good silk and unwinds beautifully. You will find no foul places in it, and I sincerely hope that it may prove acceptable to the sewing silk manufacturers. I consider that we have never made such good, even, size and winding throughout the skein as we get now, and to do this, of course, there is very little waste." One thing has been proved, and I have been permitted to bring it home to the minds of impartial and unprejudiced manufacturers in England and on the Continent, that the Bengal cocoon has not the inherent imperfections which it was thought pertained to it, and that there is a prospect of a greatly enlarged output of silk from Bengal for several important purposes in the silk trade of Europe and America. There may be men in the city who may tell us that Bengal silk, to use a familiar expression, is a thing of the past; but I ask are they manufacturers? Are they sericulturists? The opinions of practical workers of silk, coupled with my own knowledge of its structure, are of more importance to my argument than what may suit the exigencies of the market to gainsay or to uphold. You have heard what I have got to say about the fibre of Bengal silk—the practical opinion which has taken thirty-five years to form, and a scientific opinion based upon observed facts. I will now give you the opinions of a few manufacturers who have been recently working better reeled Bengal silks. First, sewing silk. Several of the best manufacturers of silks for sewing purposes, in Leek, have assured me, after full examination and trial, that this silk is particularly applicable to their trade. Mr. S. Gibson, a Leek manufacturer, writes:—"I am very pleased with the five bales of Bengal silk I have just bought; they work very freely, almost running from beginning to end of the skeins without breaking down, which means winding without loss. The strand is of nice even size, suitable for the Leek trade, free from rough or slubby places, so much so as to render one important process in the manufacturing unnecessary, viz., cleaning. I am working these new Bengals in both the bright and washed state, and they are coming out at about one-half the cost of original Bengals. If this improved reeling is maintained, it must have a serious influence on the China

\* During the time that this paper was passing through the press, the price increased to 15s. 6d., and, owing to the increased demand, the stocks in London became quite exhausted.

and Canton raws." Mr. S. Goodwin, another silk manufacturer, and President of the Leek Silk Association, writes:—"I have worked the sample skein of Bengal raw silk, and am pleased to say that it is simply perfection. As to reeling, I may say that it would almost without a break from end to end." This silk was reeled by me in Bengal with the Tavelette Consono. The silk of the Bengal worm, by its greater elasticity, is much better adapted for sewing silk than any other. I have estimated, in experiments conducted during the last few days, the tension of the bave, or double fibre deposited by the silk-worm, of the Bengal Madrassee or hot weather cocoons, the Bengal Desi or November bund cocoons, and of Italian cocoons. The results are shown in the following table, each figure being the average of numerous determinations, and representing the number of centimetres, which three decimetres of the bave is capable of extending before it breaks:—

	Tension at the end of the cocoon bave which is at the surface of the cocoon immediately beneath the superficial loose fibres or waste.	Tension at the middle of the cocoon bave.	Tension at the end of the cocoon bave which is nearest the telette or inner envelope.
Madrassee Cocoon	4'4	6'3	5'6
Desi Cocoon - -	3'6	5'7	4'8
Italian Cocoon - -	2'6	4'9	3'3

Second, Organzine and Tram for weaving. Mr. Nicholson, silk manufacturer, Macclesfield, in a letter to me, writes the following:—"In answer to your inquiry, I consider that good Surdah raw, when well reeled with plenty of spin upon it, will work well. It will then be a good substitute for Italian, its cheapness being the reason for its use." In addition to this, I may say that Mr. Nicholson is speaking of a Bengal silk that was not reeled by the Italian method. I contend that there would be no greater evenness of thread in the Italian silk over Bengal if the Italian method of reeling were used. Messrs. G. Davenport and Co., of Leek, to whom I sent a portion of the 10 to 12 deniers, which I saw reeled by the Tavelette Consono in Bengal, have thrown it into organzine and tram, and send me the following report:—"The slip winds beautifully. Enclosed are samples of two threads tram and a 500 yards skein of organzine. The silk is very clean. We consider it equal to ordinary Italian. It was running for an hour and only broke down once." Now it is necessary to say that, even with every improvement, Bengal silk may not be expected to rival or supersede the *finest* qualities of silk in the market. An objection or two from me may suffice. It will never be as white as China silk, because one is from a yellow cocoon and the other from a white one. It will not boil-off or condition as well as the silks of Italy, China, or Japan, because it contains more gum or grès than these, and this brings me to an entomological point, namely, it is probably not of the same species, but of this further on. I must guard myself against being thought slack in acknowledging the claims which at least three well-known Bengal firms have, on the consideration of European manufacturers, for careful reeling. The excellence of the silk produced at Surdah and its allied factories in the District of Rajshahi and other parts of Bengal, that of the Bengal Silk Company's factories, the chief of which is at Berhampur, and that of the well-known firm of Messrs. Louis Payen and Cie, are too well known to need mention. I acknowledge with much pleasure the kindness I received from them all, and they are well deserving of the confidence of all interested in silk. But, apart from the efficiency of these well-known firms, there remains the much larger native industry, the reeling that is carried on in the numerous villages under the shade of banyan, palm and mango groves. I visited many of these, and found the appliances very rough and rude, the reeling by them varying from 10 to 20 cocoons in almost as many seconds. In the Rajshahi District alone, out of 97 filatures, 63 are native, and the remaining 34 European, eleven to twelve thousand natives being employed in silk reeling in this district alone, 150 square miles of which exist under mulberry cultivation. If these village native filatures can be induced to improve their reeling, a largely extended industry lies waiting for them in their own

country; for it goes without saying that the resources of China and Bokhara would not be drawn upon if Bengal silks were of the required quality. Many native manufacturers assured me they would much prefer to buy Indian silk if only the quality were good enough. The consumption of silk for native uses alone is enormous. All Hindoos wear it at meals or worship. The Mahomedans wear Mashru, or cloth of cotton-warp and silk weft, the wearing of pure silk fabrics being forbidden by the Koran. Since I was in India, another silk-reeling machine has been brought to my notice by the Under-Secretary of State for India. Its inventor, Mr. Serrell, of New York, claims for it that unskilled labour can be used with its aid in reeling cocoons. This machine is automatic, and, by means of a feeble electric current which controls the feed, takes up another cocoon thread when one breaks, so that a new cocoon is added whenever required to keep up the size of the thread. It is stated to do two and a half times as much work as the present system, at a saving of 2s. 9½d. per lb. in wages, and one reeler can attend to six bassines. Two of the largest silk-reeling firms in France are in treaty with Mr. Serrell for the examination of this remarkable invention, and are willing to adopt it, if its expectations are realised. I am very sorry not to have been permitted to have this machine at work in this Exhibition side by side with the other two. Should it really be able to do what Mr. Serrell claims for it, it will be a valuable addition to the Bengal silk industry, and I commend it to those interested. Indian Sericulture has received a new impetus in a scientific direction. When in Calcutta, I suggested to Mr. Buck the desirability of a scientific investigation of the silk-worm being commenced, with a view of inquiry into and amelioration of disease, the breeding of the worms, the growth of the mulberry food, the exorbitant rental of the mulberry lands, and all that relates to the production of good cocoons. Mr. Buck acceded, and at once set about organising the means without raising objections. He charged the Indian museum at Calcutta with this inquiry, and Mr. Wood-Mason, the assisting superintendent, immediately began it methodically. The first-fruits of it are to be seen, I am delighted to state, in the Indian Silk Culture Court, in a series of cases of moths and cocoons of extreme interest. Hitherto the entomologist has alone occupied this field of research, but now the zoologist takes part with him in the study, and we may confidently anticipate that, when biological and morphological attention has been directed to the subject, we shall be in possession of much valuable information, which, in my opinion, Bengal Sericulture has for a long time greatly needed. Thus the absolutely entomological phase merges into the zoological one, and the morphological study of egg, larva, and moth, becomes an important adjunct to this industrial pursuit, which cannot fail to be greatly strengthened thereby. A sericultural laboratory has been constructed at the Indian Museum, Calcutta, and life studies of various species of silk-worms are being daily conducted. Already Mr. Wood-Mason has found a disease in the Bengal worm which proves fatal, to the extent of 60 per cent., and which was not previously suspected. Even its existence was by some observers denied. In the published catalogue of the collection he has sent over, he states the Desi or indigenous cold weather moth to be *Bombyx fortunatus*, and the Nistry or Madrassee one *Bombyx crasi*. The Eria silk-worm he calls *Philosamia ricini* instead of *Attacus ricini* as heretofore, and *Antheraea Assama* is changed into *Antheropsis Assama*. It would be wrong if I did not here mention the great service to the entomology of Indian silk rendered by Mr. F. Moore, to whom is accorded by European consent the highest authority on this subject. For many years, Europe has been indebted to him for much patient and laborious investigation, and it is to be hoped that his researches will before long be published.

Mr. J. Juvenet has sent to the New Orleans Cotton Exchange a bale of ramie, and to the Produce Exchange a bale of jute, which he represents to be the first bales of these products ever made in the United States. He says that in Louisiana a net profit of 69¢ per acre can be made by cultivating ramie, and that the cultivation of jute will yield a net profit of 56¢ per acre. A second bale of ramie has been sent to London, and a second bale of jute to New York.—*Carpet Trade Review*.





### New Cloth Patterns for Autumn and Winter, 1887-8.

**I**N the new worsted, woollen, and mixed cloths for ladies' and gentlemen's wear for the winter season, 1887-8, patterns of the latest ideas of which we have now on hand, there are some new and striking effects, both in designs and colourings. Manufacturers of the above named fabrics are, as each season comes round, put more and more upon their merits in producing saleable cloths, and the trouble and anxiety they have often to pass through to keep their stand amongst their competitors, if it could be made obvious to the wearers of these products, would greatly surprise them. In the patterns now before us, and which we, as usual, are issuing to our readers at £2 per 100 samples, the worsteds claim the first attention. On the whole, they are of a more subdued character than has been the case during the past few seasons. Silk, in bright colours, will be used more sparingly, with some few exceptions, both for coatings and trouserings, and likewise for mantlings. In striped fabrics, the stripe is generally more or less broken by effects in the colouring, whilst checks are also broken, more or less, by faint effects, produced by fine counts of silk yarns. In colourings, the tendency will be to have them equally distributed, so that one does not show more prominently than the others. Exceptions may, nevertheless, be made, but they will be comparatively few. We are now speaking more particularly of the finer classes of these fabrics. In black and self coloured worsteds, there will not be anything very striking, judging by our patterns, as producers of these fabrics have "rung the changes" on designs and different counts of yarns until it appears impossible to ring more out of them, and, consequently, novelties in this branch seem to be out of the question. In the medium classes of worsteds, the same tendency will be observed as noted above. In the lower descriptions, amongst which may be classed union cloths, there is nothing worthy of note, the changes being of no account. In mantle cloths, there are so many attempts at new effects, that it would be impossible to particularise them. Curled and such like fancy yarns will be used, but in a modified form, and, in most cases, the curls will be pressed, more or less, on to the face of the cloth in the finishing process. In the composition of these cloths, silks will be used in varied proportions, blue, scarlet, and similar bright colours being blended to form broken patterns, any stiff design being conspicuous by its absence. These mantlings can, in numerous cases, have cotton and other cheap yarns in their composition. In tweeds, chevots, and such like cloths, the variety is large, both as regards design and colouring, but the least likely patterns to find favour will be those in strongly marked stripes, although there will be a few specimens of this class. The tendency will be to broken checks, over-checks, and combinations of stripes and checks. In tweeds, a proportion, in addition to having a check, will have a hair-line effect, both the former and the latter showing up prominently. There will also be many tweeds of the old mixture type, where there is no distinct pattern to be seen on the face of the cloth. These, as a rule, will run in the lower qualities of goods, although they will only be a small proportion of this class of fabric. In patterns of a distinct character, in tweeds, chevots, &c., more colour will be used than in worsteds, and their effectiveness will be got mostly by the colourings. In some few fabrics, silk effects will be prominent, but these may possibly not rule as favourably as during the past few seasons. Cloths, generally, will have a moderately smooth finish, but, in many cases, a rough appearance will enhance their value. Fabrics having a draw, or very smooth finish, which generally requires a longer staple in the yarn, will not be in great demand, except for the making of special articles, such as caps. The foregoing will give our readers a general outline of the fabrics, which are calculated to meet with favour during the winter 1887-8, and will enable them to judge fairly as to the fashionable cloths for that period. We are now giving in our journal, month by month, several

designs, with full particulars of colours of warp, weft, &c., as specimens of the fashions above described; all of which are, and will be in the future, dissected from patterns selected from our stock of samples. Our subscribers, therefore, who care to profit by putting these designs into work, can see for themselves the fashionable goods for the coming season, and judge as to the utility of sending them out to merchants, and by them procuring new orders. We shall be glad to send out parcels of patterns on the terms named at the commencement of this article, and request manufacturers, in ordering, to state particularly the kind of fabrics, whether worsteds, tweeds, &c., that they require.

### Consular Reports.

Vice-consul Longford, writing on causes of declining trade with Japan, states that:—"The import trade of Japan has declined from £6,359,163 in 1881, to £4,928,179 in 1885. The English portion of it (exclusive of Indian and Colonial trade) has, in the same period, declined from £3,353,430 to £2,554,250, and the value of the leading English staple (cotton) manufactures from £2,203,598 to £1,171,870. While, therefore, the whole import trade of Japan has, in five years, declined in value by over £4,000,000 sterling, the English portion of it has alone declined by little less than double that amount, and the import trade of other foreign countries or of the English Colonies must have increased by an amount almost equal to that of the English decline. In the case of the latter again, the decline in the value of one staple, in which England has almost a monopoly, has amounted to over £1,000,000 sterling, and it has already been shown that there has also been a large decline in the import of English woollen manufactures. It follows, therefore, that there has been considerable increase in the import of other articles in which England is interested, and that the decline in the British import trade is wholly in cotton and woollen manufactures. The causes of this decline are, no doubt, ascribable, in a considerable degree, to the general trade depression of the last few years, and, more recently, to the distress caused among the Japanese farming classes—the principal consumers of cotton goods—by the lowering of prices consequent on currency contraction." They are ascribed, also (and to this cause we wish particularly to direct the attention of our readers), to the little effort which has been made by English manufacturers to consult Japanese taste and requirements, and the mode, also, of conducting business, which circumstances have hitherto imposed on the English importers in Japan, has not been without effect. The Japanese are almost universally clothed in cotton, and as long as English piece goods were supplied to them of good value, and at a cost below that at which they could purchase the productions of their own hand looms, they were ready enough to buy them; but, in consequence of deterioration in the quality of the manufactured articles sent them, they decided that it was better to purchase the higher priced home-made material. A proof of this, says Mr. Longford, "is found in the fact that while the import of English piece goods has so steadily declined, that of raw cotton has trebled within a few years, and tends to show that a continuing demand for native-woven goods is anticipated by the Japanese themselves," and whilst Mr. Longford suggests that "the cause of the declining import can be remedied only by English manufacturers themselves," he affirms that the uphill struggle will have to be made before they can win back the good name formerly enjoyed by their productions, and for the loss of which they have only themselves to blame. Not only, says the Consul, "in the sense already stated have their goods failed, but in other respects they have entirely neglected to take means which lay at their own command for possibly rendering their goods more popular;" and the concluding portions of Mr. Longford's letter are of so much interest to many, that we will submit them to the earnest attention of our readers. "British importers here, no doubt, carefully watch any changes in the local markets, and as far as lies in their power, keep producers in England well informed of such articles as are likely to meet with popular approval in Japan. But such information as can be given by persons who have no practical training in manufacturing must, it is evident, be very inferior to that which could be supplied by a qualified expert, a man who was thoroughly versed in the whole process of the making of cotton piece goods. If men of this class were sent out to Japan by any large manufacturers, they could study on the spot the wants of the people, could ascertain the dimensions, quality, and patterns of the goods most in vogue amongst the Japanese, and the information which they could supply to their principals in England would certainly go a long way further in enabling the latter to judge of what would meet with a sale in Japan than what is furnished by importers, every one of whom deals not in cotton goods alone, but in almost every single article which appears in the import trade returns. I believe that not a single expert of this class, whether a practical manufacturer or a designer of patterns, has ever yet been sent out to Japan by any individual British manufacturer or combination of them, though it seems that the expenses of such a course would have been amply justified by the prospect of retaining or extending an annual trade of over £2,000,000 sterling. No effort ever seems to have been made to send out articles made up ready for immediate use by the ultimate consumers in the innumerable shapes in



which cotton piece goods are used by the Japanese, neither has the slightest attempt been made to meet their tastes for changing and fanciful patterns. Each year's production of cotton goods in Japan brings forth a host of new and artistic designs, whereas those imported from England maintain almost year after year as unchanging a uniformity of pattern as a steady increasing deterioration of quality. The combined influence of all Her Majesty's diplomatic and consular agents in Japan would not, I feel assured, effect the sale to the wholesale distributor of one single additional bale of imported cotton goods beyond that which can be ultimately disposed of to the individual consumer, and no increase of purchases by the latter need be hoped for till more effort is made by producers to satisfy his peculiar wishes and requirements. Nearly 30 years have now elapsed since foreign merchants first began to reside in Japan, and absurd as the statement may seem to those who are not conversant with the conditions attached to their residence, I believe I am not incorrect in stating that they are not now one single step further towards knowledge of the *bona-fide* Japanese commercial classes than they were one year after the country was first opened to them. They have little or no opportunity of meeting any but brokers, and with them they have conducted their dealings, either through Chinese or native employes of the same class in life as the brokers, or, if in person, by means not of the Japanese language but of a vulgar and a degraded patois bearing as much resemblance to Japanese as the gibberish of a West Indian negro does to the English spoken by a highly educated London merchant. British merchants resident in Japan will, however, have to recognise, if they mean not only to develop but even to maintain their present trade and faithfully represent the interests of producers at home, that a new order of affairs is rapidly rising in Japan, and that once the large Japanese dealer is in a position to make his purchases direct from importers, he will go to those who are nearest at hand to him, with whom he is able to converse freely in his own tongue. The acquisition of the Japanese spoken language, with the aid of the numerous able grammars that now exist, is by no means a task of insuperable difficulty, but so little encouragement has the system of business hitherto followed given towards undertaking its study, that of all the British merchants and clerks who have resided in Japan, I cannot recall a dozen instances of those who have seriously attempted it. Two instances are present to my mind of those who have, and who, by the aid of their knowledge of the language, broke through the gordon of middlemen that was around them, and they have long since left Japan after most successful careers. A few more still remain in Yokohama, whose attainments in Japanese are of a high order. They have, however, not as yet been able to reap that advantage from them which it may be hoped a new order of affairs will soon give them, when, on the whole country being thrown open to foreigners, the business of the importer will stand side by side in the Tokyo, with that of the Japanese dealer. What the importers will then, from time to time, be able to learn of the requirements of the Japanese people, combined with attention to his information on the part of the producer in England, will soon tend towards obtaining for British staples a demand surpassing any that has hitherto existed. If, on the other hand, importers in Japan, and producers in England, remain content to continue under the changed circumstances in their present lines, they must be equally content to see their trade in time either disappear, or pass wholly, as it has already in part, into the hands of foreigners." Sir F. Plunkett, the British Minister at Tokyo, calls earnest attention to what Mr. Longford states as the necessity of British merchants and manufacturers cultivating friendly and intimate relations with their Japanese customers, and adds:—"At present too many of them take too little trouble to inquire what are the requirements of the local buyers, but methodically deal, year after year, through the same channels, in almost the same articles. It can be easily understood how foreigners, who take pains to learn and meet the tastes of the native market, are supplanting British manufactures, even in textile fabrics, which could no doubt be produced better and cheaper in England, if attention were properly called to the matter. The state of things, which will, I trust, be inaugurated under the new scheme of treaty revision, will open up facilities for trade with Japan, by which I hope our countrymen will greatly profit, but to do this, they must awaken to the fact that Englishmen are not alone in the field, and that if they are not up and stirring, the new opportunities will be utilised by more active competitors from the Continent or from America."

An exhibition of Irish manufactures is projected in New York, with the view of creating a market in America for exclusively Irish productions. The proposal, so far as it has gone, is said to have met with the support of many influential people, and the preliminary outlay is to be provided for by the issue of shares in small sums. An earnest appeal is made to Irish firms to show what they can do, to make the most of a golden opportunity in the hope that truer knowledge of the capacity of the country may be brought home to the American public, and result in extensive patronage to the depot or agency for the sale of Irish goods, which is intended to be established with the surplus which the promoters are already sanguine enough to anticipate. So far, we are very pleased to write, there has been no indication of the plan being taken up and carried out in any party spirit. We may hope that there will be only an endeavour to promote the welfare of the country, and to establish contentment and peace in it, without giving any political complexion to what would be then a very laudable endeavour to do good.

## Manchester Chamber of Commerce and Free Trade.

At the quarterly meeting of the Manchester Chamber of Commerce, held on the 2nd inst., the subject which occupied the most attention was "Free Trade." Mr. W. A. Russell moved:—"Having waited in vain more than forty years for other nations to follow England's Free Trade example, this Chamber thinks the time has now arrived to reconsider its position." He stated that Mr. Cobden's anticipations with regard to other countries following England's example, with reference to Free Trade principles, had not been verified; but, on the contrary, instead of going in the direction of Free Trade, they had gone in the opposite course. The tariffs against this country in the United States and on the Continent had been raised from 10 or 20 per cent. to 40, 50, 60, and in some cases even to 70 per cent.; and, in his (Mr. Russell's) opinion, there was not even a hope that they would ever be fulfilled, for it would be impossible—treason, indeed—for foreign nations to cause those anticipations to be realised in view of the industries that had been built up by Protection; and, instead of things improving permanently, they would find, as each winter came round, an increase in the number of unemployed. If anyone, ten years ago, had predicted that trade in this country would be reduced to its present position, he would have been laughed at. No one thought then that competition would have brought things to such a pass. In his opinion, this unparalleled trade depression was caused by the simple fact that foreigners had got machinery and good workmen, and were quite capable of producing for themselves almost as cheap, if not as cheap, as England could. At any rate, we knew they made very considerable profits, and any surplus goods they had, they sent here practically untaxed, while, on the other hand, they would not take our goods. In some cases our goods got in, and some yarns as well, but our principal exports were coal and machinery. His idea was that we should draw closer together the ties which bound England to her colonies and dependencies, and enter into a federation with them upon Free Trade lines, or as near such lines as possible and, having done that, we should go to those countries which now tax our goods, and invite them to come into what he would call a Customs Union. If they declined to do this, he would act towards them on the principle laid down by John Stuart Mill, when he wrote that a country could not be expected to renounce the power of taxing foreigners, and that, unless foreigners would, in return, practise towards itself the same forbearance, the only mode in which a country could save itself from being a loser, by paying duties imposed on its commodities by other countries, was to impose corresponding duties on theirs. That was the policy he advocated, and he appealed to the Chamber to take up this question, and put itself in accord with the times in which its members lived.—Mr. John Hibbert (Chorley) seconded the resolution. He contended that English trade had increased, not through Free Trade, but in spite of it, and that statistics conclusively proved that the protected countries of Europe and the United States had largely improved their commercial position, notwithstanding the protective duties they imposed on foreign manufactures, whilst, on the other hand, England's trade was either stationary or declining. He had noticed that the advocates of a continued Free Trade policy usually ignored the fact that, before England was a Free Trader, she was the largest commercial nation the world had ever seen. We obtained a monopoly and kept it for a certain period, and increased our trade as the population increased, and as the ramifications of our trade extended; but other nations, seeing we were pinned to a system, placed import duties on our goods, with the result that in many cases we had a lessened profit and trade. Had it not been for our colonial trade, our commercial supremacy would have been a thing of the past. In 1871, our foreign export trade was £171,000,000, while in 1885, it was only £135,000,000, whilst our export trade to British possessions had, in the same period, risen from £51,000,000 to £77,000,000. He had no hesitation in saying that, unless some change was made in our policy, Germany would, before ten years had elapsed, be the leading commercial nation of the world. Discussing the question of remedy, he suggested that, unless the United States of America admitted our goods duty free, we should charge 6s. per quarter duty upon American wheat.—Mr. W. Fogg said the resolution was a mistake from beginning to end. The mover began with the assertion that Cobden's anticipations had not been fulfilled. He (Mr. Fogg) contended that Cobden's anticipations were of secondary importance, and that what they had to consider were Cobden's principles. Mr. Hibbert had based his argument on the assumption that protectionist countries were not handicapped. He contended that they were, and he also held that Free Trade, even as a monopoly, was a good thing for England.—Mr. Helm spoke in opposition to the resolution, and Mr. W. Mitchell (Waterfoot), maintained that, under the present unfair condition of things, England is gradually going from bad to worse, and that by following the example of Canada in her dealings with the United States, some benefit might be gained by England.—Mr. Houldsworth, M.P., objected to the resolution on the ground that it was not sufficiently definite, and did not go far enough.—Mr. H. G. Barber stated that the manufactures of the Mundella Mills in Saxony were for export to this country and America, and that the tariff on the raw material, imposed by Germany, was a disadvantage.—Mr. Hoyle agreed that it was a working man's question, and that this class had greatly benefited by Free Trade.—Mr. Molesworth-Hepworth spoke in support of the resolution, which was lost—21 votes being for, and 22 against.



## Congo State and the Prospects of the Cotton Trade.



HE constantly increasing discoveries in the interior of the Congo States, says the *Manchester Guardian*, seem to promise a brilliant economic future for this interesting enterprise. The language of probability, rather than of certainty, is appropriate, because there is a considerable element of doubt, not with regard to the capacities of the Congo basin, but with regard to the political future of the new State. In other words, if the

Congo State can retain its territories in spite of the greed for colonies of the European Powers, and if it can maintain its position of authority over the immense native population, it must necessarily open to European manufactures a market practically inexhaustible. Since Mr. Stanley endeavoured to interest the manufacturers of Lancashire in the Congo basin, the gradual exploration of the country has more than justified the calculations which he made, and which, by their very magnitude, seem to have suggested scepticism.

..... The results at present obtained are sufficient to make it certain that, supposing the State to have a secure existence, the long-talked-of railway to Stanley Pool must easily repay its cost of construction. The abandonment of the project by the English Syndicate has been followed by the formation of a Belgian Company, of which the programme is published in the current number of the *Revue Geographique*. The new Company is to commence its work in a judiciously tentative manner by sending out an expedition of engineers to thoroughly explore the possible routes for the railway. This preliminary survey is expected to occupy about eighteen months; after which the actual project of construction will be taken up. The interval of suspense thus created will probably serve to ensure the success of the enterprise by allowing a further reconnaissance of the navigable regions to be opened to commerce and a clearer possibility of judging as to the chances of survival possessed by the Free State. The territories of the Congo State are, for practical purposes, contiguous to those of three European Powers. At the mouth of the Congo, the traditional claims of Portugal and the ambition of M. de Brazza have shut in the Free State, so that it reaches the ocean only by a narrow strip of land. But at Stanley Pool, its possessions expand to the size of a small continent; and if the Germans are able to occupy all that they have marked out for themselves on the east coast, a line through the Great Lakes will ultimately be the border between German and Belgian or international rule. From Germany, for many years to come, the Congo State has nothing to fear. The State is not now, and cannot for a long time hope to be, in a position to defend itself against a Great Power. It exists by the sufferance of France. No doubt, it has been recognised by a sufficient number of Great Powers to render its legal basis safe. But recent events in Europe have shown too clearly that weak States can find no guarantee in a legal or moral status, and that force can be resisted only by force, which will be forthcoming only when its employment is dictated by the material interests of those who possess it. We are far from attributing to the French Republic any sinister designs upon the Congo State. Experience, however, has shown that, in the present condition of French politics, it is not impossible for an adventurer to commit the French Government to a course of action of which the majority of the people do not perceive, until too late, the true import. Colonial quarrels are apt to be invented by local officials, and to be carried to a point where their peaceful settlement is difficult, before the authorities at home have had the opportunity of exercising any control. Fortunately there is no perceptible reason why any Power should wish to interfere with the magnanimous idea in course of realisation under the auspices of the King of the Belgians. The whole of the Free State lies within the limits of the conventional area assigned to free trade by the Conference of Berlin, and, therefore, subject to the regulations of the Government of the State, the subjects of all Powers are equally entitled to trade freely upon the whole of the navigable waters of the Congo and its tributaries. France has already acquired, by the agreement concluded in the winter of 1884-5 with the Congo State, a territory large enough to absorb, for many years to come, all the energies which one country can spare for the

purpose of colonisation in the tropics. Germany, having taken pretty nearly the whole east coast from Cape Delgado to the Gulf of Aden, has acquired an African "India" large enough to occupy her for a whole generation. Germany, therefore, will undoubtedly be anxious to further the endeavours of the Congo State to introduce order on the landward side of the region which she proposes to make in fact, as well as in name, her own. The interests of British manufacturers are all on the side of the Free State. For all these reasons, it is permissible to hope that the State of which the King of the Belgians is the patron, and of which Mr. Stanley has been the pioneer, will be allowed to develop without interference from the European Powers. But there is a danger from within that cannot be lost sight of. The population of the Congo basin is immense. For any length of time to which rational forecasts can apply, the European settlers, organisers, or rulers, must be a mere fractional percentage. Any general hostility on the part of the natives means extermination to the white men. Hitherto, the bulk of the natives have been tractable, and the Europeans have known how to deal with them on just and friendly terms. The authorities of the Congo State are fully alive to the necessity of a cautious and tentative procedure, and for this reason are rightly anxious rather to delay than to hasten anything like a rush of European traders. If the condition of the natives is not troubled by anything but the growth of the European organisation, a future, prosperous alike for them and for the State, may be awaited. But there are not wanting the signs of a peculiar ferment in Central Africa. It is certain that the slave raids, which have long been the curse of the Southern Soudan or Upper Nile basin, have, within the past three or four years, extended to the watershed of the Upper Congo, where they have produced widespread desolation, panic, and unrest. It also seems probable that the centre of Africa is the scene of a great Mussulman propaganda, covering, perhaps, the whole region between the Nile and the Niger. A movement of this kind, in its very essence military and aggressive, and working upon populations practically inexhaustible, may sweep like an avalanche over the continent, and destroy in its course every vestige of European civilisation and endeavour. The flotilla and the scattered stations may, in time, if left undisturbed by more than local troubles, effect an enormous civilising work. But in anything like a *Völker-Wanderung* they would be obliterated. We have ventured roughly to indicate what appear to be the greatest dangers that may possibly confront the opening up of Central Africa, partly because the speedy prosecution of the work is, after all, the best means of preparing to meet them. Every European investment in the Free State or in the enterprises which it protects is, as far as it goes, a guarantee against European interference with the State. The construction of a railway to Stanley Pool, and the consequent augmentation of the fleet of steamers on the Upper Congo and of the personnel of the Administration, would so strengthen the up-river stations as to give them the chance of resisting even formidable attacks by the natives. As soon as the communications—whether by railway, road, or river—have made the Upper Congo accessible from both sides of the continent, the days of unlimited barbarism will be over, and the Africans will have to accept civilisation. The hope, which was for a time entertained, that the railway to Stanley Pool would be constructed by British capital has had, through the force of circumstances, to be abandoned. This disappointment need not prevent Englishmen from giving their fullest sympathy and their actual support to the Belgian undertaking that has the same end in view.

According to *Kemp's Mercantile Gazette*, the number of Failures in England and Wales gazetted during the five weeks ending Saturday, October 30th, was 469. The number in the corresponding five weeks of last year was 387, showing an increase of 82, being a net increase, in 1886, to date, of 356. The number of Bills of Sale published in England and Wales for the five weeks ending Saturday, October 30th, was 1,254. The number in the corresponding five weeks of last year was 1,282, showing a decrease of 28, being a net increase in 1886, to date, of 332. The number published in Ireland for the same five weeks was 79. The number in the corresponding five weeks of last year was 101, showing a decrease of 22, being a net increase, in 1886, to date, of 111.





## ORIGINAL DESIGNS.

Our first plate contains a design drawn by Mr. F. Layton, York Terrace, Akroydon, Halifax. It is intended for a Printed Cotton Curtain, and would be an effective pattern with buff ornament on a blue slate ground.

A double page design, suitable for Damask, occupies the second plate. It is the work of Mr. R. T. Lord, 97, Park Road, Bradford.

## A CORRECTION.

We beg to correct two mistakes that occurred in the notice which we gave in our October issue, of S. C. Lister, Esquire. We stated that Manningham Park was valued by Mr. Lister at £103,000—the sum should have been £70,000; also that Mr. Donisthorpe was partner at one time with Mr. Lister. The only partnership that existed between them was for a very brief period—viz.:—between the purchase of the first and the second half of the patent of the original combing machine, and was put to an end by Mr. Lister purchasing the second half of the invention.



**Wool.**—There has been a quietness in the wool trade during the month. What has sold has been mostly for actual requirements, and, consequently, the quantity disposed of by staplers has ruled below the average. Users have bought sparingly, the prevailing opinion being that at the next London sales, at the latter end of the month, prices will have a downward tendency. Stocks on stapler's hands are not large, and extreme caution is brought to bear upon wools that they buy. On the whole, prices have not shown any quotable reduction, and spinners, who have bought during the month, have had to give nearly full rates. The yarn and piece branches have improved slightly; in many cases, more money has had to be given by merchants on placing new orders. In the Bradford district, the outlook is fairly cheering, as both spinners and manufacturers are running full time, with some few exceptions; this applies to makers of the varied classes of yarns and pieces for which Bradford is generally noted. Botany and the finer classes of yarns still lead the way, and, judging by reports, are likely to do so for some time to come. Medium qualities have been in moderate demand at firm rates.

**Cotton.**—Business as regards the raw material has been of a fluctuating character both in the volume of trade done and the prices obtainable. The sales have, perhaps, been of an average quantity, at slightly lower rates, taking the whole month as an index. The yarn branches have generally improved, stocks have been considerably reduced, and spinners are fairly well engaged upon orders which will last for a few weeks at least. Their position is much improved as regards prices, higher rates have generally been asked, and, in numerous cases, been conceded by manufacturers and merchants. With the exception of some few kinds of yarn, that have not been in demand, prices for all sorts have rises, and at the end of the

month were very firm. As regards cloth, there is not much change to note, perhaps, scarcely as much business has been done, but still manufacturers are not at present disposed to grumble at their prospects, especially when comparing them with twelve or eighteen months ago. Full prices have been maintained, with no particular desire on the part of producers to lower rates, even for large orders. The great drawback to both the yarn and cloth trades is the many petty strikes that keep upsetting the calculations of spinners and manufacturers, who have taken orders at a profit on the present scale of wages, and who, if they have to give the operatives an advance, are thereby losers. On the whole, the feeling between masters and employés is much better than formerly, and it is hoped that it will continue.

**Woollen.**—Manufacturers of nearly all classes of woollen fabrics keep fully employed, and many firms, especially in the Yorkshire districts, are running full time. Worsted cloths still lead the way, the demand for anything in fancy goods, with effective designs and colourings, meeting a ready sale in the markets, at a fairly remunerative figure. Tweeds, chevots and such like materials, in the various qualities, are also in good demand, although prices for these do not come up to the wishes of the producers, rates not having risen in comparison with the recent rise in the raw material, still manufactures are in a better position in this respect than they have been for some time past. Orders, both for the home and foreign trades, are numerous, and seem to include all descriptions of woollen, worsted and mixed fabrics. The export trade to the Continent is well maintained, and the same may be said of the United States and Canada, and much improvement has taken place in trade to the Southern portion of America. The great difficulty with manufacturers is the merchants offering low rates for goods, although, in this respect, the latter are not having all their own way, as producers generally hold out for higher prices. On the whole, the prospects for the next few months are bright.

**Linen.**—There are no new features to note in the linen branch of the textile industry. The signs of improvement are very few, the least satisfactory feature being the very low rates offered for nearly all classes of goods. The flax market has continued quiet, the business passing having been of a hand-to-mouth character. Prices show no quotable change. The stocks on hand are not of great dimensions, but still, consumers are not disposed to purchase more than are needed for actual requirements in view of the new crop coming to hand shortly. Jute yarns and goods have been in fair demand at firm prices. This branch is, perhaps, the most cheering.

**Lace.**—This department remains in a very unsatisfactory condition and, judging by the present outlook, the prospects for the future are gloomy in the extreme. The Lace-makers' Union have decided not to submit to the proposed reduction in wages, which manufacturers really require if they are to keep their machinery running; the keen competition kept up by their rivals in other districts, where wages are below the Nottingham rates, makes the position in the latter locality very awkward. The curtain trade shows no signs of change, the production exceeding the demand, and, therefore, prices are considerably affected. Bobbin nets meet a fair sale, as do also low Torchou and Maltese laces, but rates are hardly remunerative. The silk branches have been dull.

## The Practical Manager's Slide Rule Companion.

BY JOSEPH HOWELL, DUNDEE.

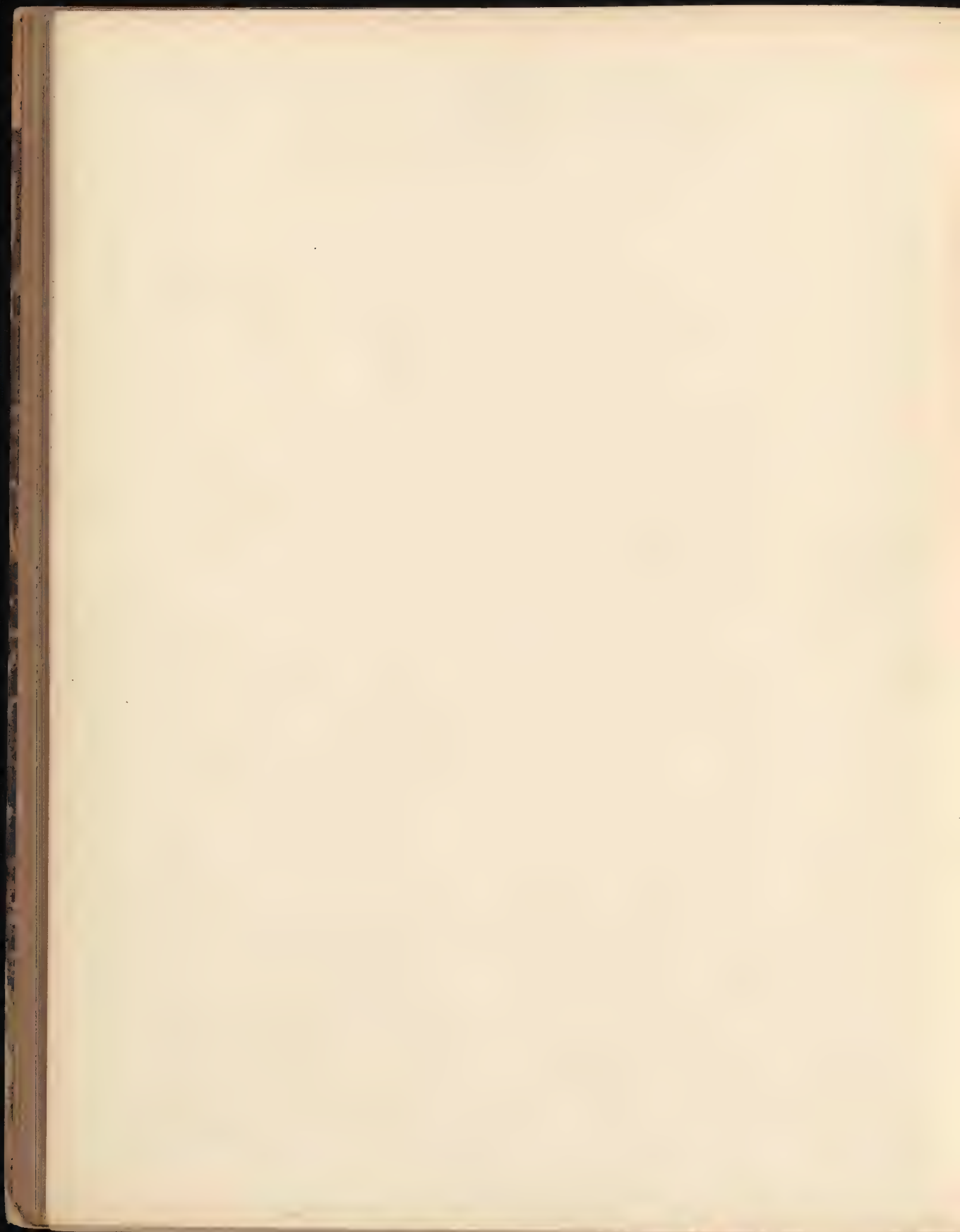
JAMES P. MATHEWS AND Co., 17, Cowgate, Dundee.

This little work was written specially for reading before the members of the "Dundee Managers' Association," and to establish its merits, we need not say more than that it gave so much satisfaction and pleasure to the listeners, who could not fail to recognise with what ease the daily calculations required to be made by managers, can, by its use, be cast up, that it was decided to publish it in order that others might reap the benefit of Mr. Howell's experience. It is adapted for mill and factory calculations, and embraces both spindle and lea yarn changes, as well as a varied selection of important problems and solutions. We would recommend it to the consideration of all to whom such a work would be a help in their daily avocations.



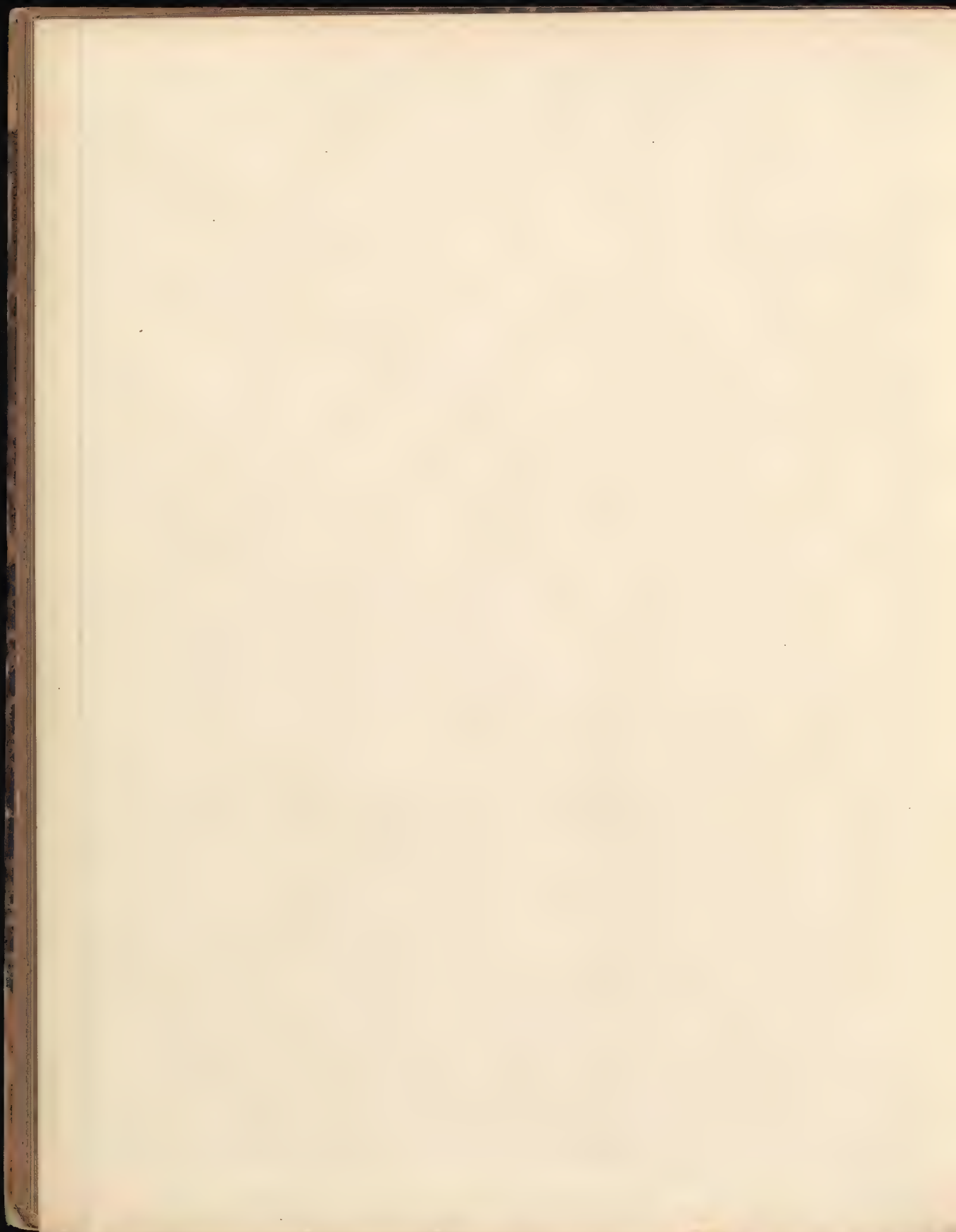


PRINTED COTTON.





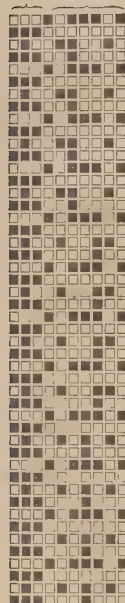




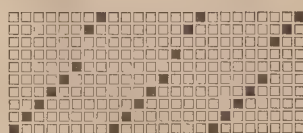




No. 410.



## Trousering.



Draft.

Warp:—2 Light Blue worsted, 2/36's.  
 1 White silk, 2/60's.  
 2 Light Blue worsted, 2/36's.  
 1 Claret " "  
 1 Light Blue " "  
 1 Claret " "

Woven:—1 pick Claret worsted, 2/36's.  
 1 " Black " "

Claret to form piping must be put in first pick.

10 healds.  
 80 ends per inch.  
 72 picks " "  
 3 and 5 ends in a reed.  
 20's slay.  
 64 inches wide in the loom.  
 56 " when finished.

Design.

Finish clear and smart.

Silk must be warped and beamed on separate beam.

Weight about 18 ozs.

## Woollen Suitings or Ulster Cloths.

No. 411.



Design.

Warp:—  
 12 ends Black self twist, 2/24 skeins woollen.  
 1 end Crimson, 24 skeins twisted to Green, 24 skeins.  
 4 " Lt. Olive self twist, 2/24 skeins woollen.  
 1 " Crimson, 24 skeins twisted to Green, 24 skeins.  
 12 " Black self twist, 2/24 skeins woollen.  
 1 " Crimson " "  
 4 " Light Olive " "  
 1 " Crimson " "

Self twist all 16 runs per inch.  
 Fancy coloured twist 5 runs per inch, } in both warp and weft.

Woven:—

Twice. 12 picks Black self twist, 2/24 skeins woollen.  
 1 pick Crimson " "  
 4 picks Drab " "  
 1 pick Crimson " "  
 12 picks Black " "  
 1 pick Crimson, 24 skeins twisted to Canary, 24 skeins.  
 4 picks Drab self twist, 2/24 skeins woollen.  
 1 pick Crimson, 24 skeins twisted to Canary, 24 skeins.

2,178 ends.

Straight Draft.

33 ends per inch.

33 picks " "

3 ends in a reed.

11's slay.

66 inches wide in the loom.

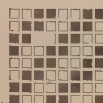
56 " when finished.

Finish soft and mellow.

Weight 24 ozs.

## Woollen Suitings.

No. 412.



Design.

Warp:—

2 Black, 16 skeins woollen.  
 1 Black, 40 skeins, twisted to Crimson 40 skeins, forming one thread at 14 runs per inch.  
 1 Black and Stained White twist made in similar way.

Straight Draft.

Woven:—3 picks, 16 skeins woollen.  
 1 pick Black and salmon twist made as twist in warp.

2,464 ends.

36 ends per inch.

32 picks " "

4 ends in a reed.

9's reed.

68 inches wide in the loom.

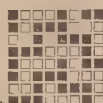
56 " when finished.

Mill to width.

Finish soft.

Weight about 22 ozs.

No. 413.



Design.

Warp:—

1 end Smoke, 20 skeins woollen.  
 1 " " 16 " "  
 1 " Black, 20 " "  
 1 " " 16 " "

Straight Draft.

Woven:—2 picks Smoke, 20 skeins woollen.  
 2 " Black, 40 skeins twisted to Crimson, 40 skeins.

4,080 ends.

60 " per inch.

56 picks " "

4 ends in a reed.

15's slay.

68 inches wide in the loom.

56 " when finished

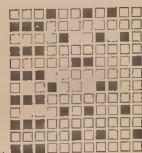
Finish soft and mellow

Clear and smart.

Weight 24 ozs.

## Woollen Trousings.

No. 414.



Design.

Warp:—

3 ends Black self twist, 2/20 skeins woollen.  
 2 " " coarse worsted, 10,000 yards to the lb., and Black mohair, 4,000 yards to the lb., knop twisted at the rate of 1½ yards mohair to 1 yard worsted.  
 6 " Black self twist, 2/20 skeins woollen.

Straight Draft.

Woven all Dark Blue self twist 2/20 skeins woollen.

1,848 ends.

28 " per inch.

28 picks " "

3, 2, 3, 3 ends in a reed.

10½ slay.

66 inches wide in the loom.

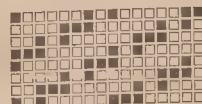
56 " when finished.

Finish soft, mellow and bulky.

Weight 24 ozs.

## Worsted Suiting.

No. 415.



Design.

Warp:—12 White worsted, 2/48's.  
 12 Olive " "

Woven:—8 picks White worsted, 2/48's.  
 6 " Olive " "

168 ends per inch.

80 picks " "

6 ends in reed.

28's reed.

66 inches wide in the loom.

56 " when finished.

Finish clear and smart.

Weight about 23 ozs.

### Necessity for Novelties in Textiles.

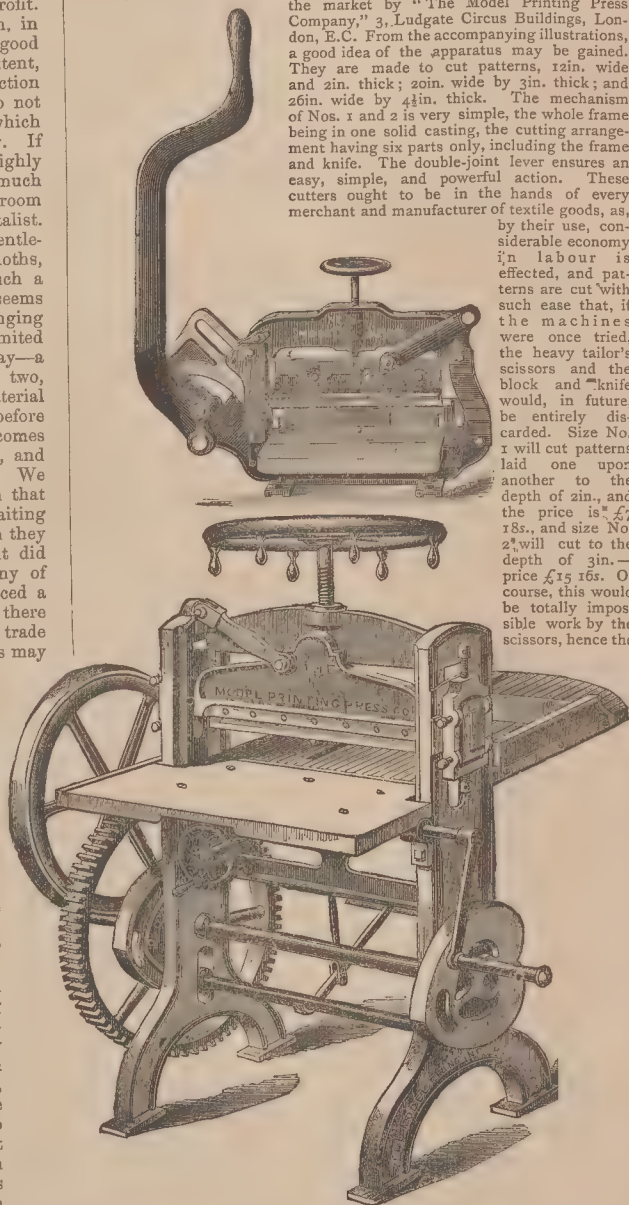
We have, on some previous occasions, spoken of the necessity existing for manufacturers to produce fabrics which, from their appearance, would be considered novelties. In these times, although trade is, without doubt, improving, we hear continual outcries. One says there is no trade, whilst another admits his looms are kept fairly running, but there is no profit. It is, of course, obvious that competition is much too keen, in the several branches which compose the textile trades, for good profits to be realised. Perhaps this could be, to some extent, remedied, if each manufacturer would strive for the production of entire novelties in their various departments. We do not think there is a single branch of textile manufacturing in which there is not room, at the present time, for something new. If we turn to those fabrics which, by reason of their highly ornamental character, are termed "art fabrics," there is much scope for experiments, and, moreover, there is abundant room in the market for the successful products of the experimentalist. In every variety of wearing apparel, for both ladies and gentlemen, there is a want of something new. In mantle cloths, particularly, a good thing would be welcomed. But such a cloth should be, in every sense of the word, a novelty. It seems to us that, as a general rule, manufacturers are given to ringing the changes—to use a well-known phrase—upon a limited number of fabrics. One season a certain cloth holds sway—a cloth which has, perhaps, been known for a generation or two, then another season sees another equally venerable material dug up from the past, and made to run another course before being quietly re-interred. Of course, here and there, one comes across something differing from the general run of things, and it is in these cases that most chance of good profits lie. We have, over and over again, heard manufacturers complain that something new was wanted, but they were apparently waiting for some one else to bring out "that something," and then they would—to use a diplomatic term—annex it. Perhaps, it did not occur to these gentlemen that as sure a way as any of gaining a good thing was to experiment until they produced a novelty themselves. Expense attending such a course there certainly is, but there is also a corresponding increase of trade waiting upon success, and, therefore, of profit. Novelties may be divided into two classes—firstly, those which are due to a new departure, or combination, in the material itself; and secondly, those which are due to some entire changes in design and colouring, but this applies to art fabrics only, except in a few cases. We know a firm who, at much expense, placed a novel material upon the market, with the result that they were enabled to ask, and to obtain, a price greatly in advance of what other manufacturers could gain for similar things, which lacked that one element—novelty, and which the other possessed, although the wearing properties of each were exactly the same. Many other instances of successful novelties have come within our notice, each one bringing a good profit in its train. There are some who have been engaged on one class of goods for a number of years. They began by making a first-class material, then, after a time, from some of those causes which operate in all trades, recourse was had to lowering the quality of their products, then came a further reduction, and so on, until there was left at the end scarcely a resemblance to the cloth first produced, and upon which no further reduction could be made. At this stage, a turn was given to prospecting, and the result was the looms were turned upon other goods, which appeared to offer a better field for operations. The probability is that such a field was already stocked to its full limits with makers. In making these remarks, we have in our minds the twistings and turnings, which have taken place in two or three branches of textile manufacture. The question is whether such a course is not "from the frying-pan to the fire," because every extra one in a trade makes competition keener. It seems to us that it would have been better for these firms if they had tried their hands on something new, and, at the present time, there are good openings, in almost every branch of manufacturing, for the production of really good novelties.

### MACHINERY & TOOLS, & C.

#### Pattern Cutting Machines.

An improved description of "CUTTER" for the cutting of patterns of cloth, and of various other kinds of textile fabrics, is now being placed upon the market by "The Model Printing Press Company," 3, Ludgate Circus Buildings, London, E.C. From the accompanying illustrations, a good idea of the apparatus may be gained. They are made to cut patterns, 12in. wide and 2in. thick; 20in. wide by 3in. thick; and 26in. wide by 4in. thick. The mechanism of Nos. 1 and 2 is very simple, the whole frame being in one solid casting, the cutting arrangement having six parts only, including the frame and knife. The double-joint lever ensures an easy, simple, and powerful action. These cutters ought to be in the hands of every merchant and manufacturer of textile goods, as,

by their use, considerable economy in labour is effected, and patterns are cut with such ease that, if the machines were once tried, the heavy tailor's scissors and the block and knife would, in future, be entirely discarded. Size No. 1 will cut patterns laid one upon another to the depth of 2in., and the price is £7 18s., and size No. 2 will cut to the depth of 3in.—price £15 16s. Of course, this would be totally impossible work by the scissors, hence the



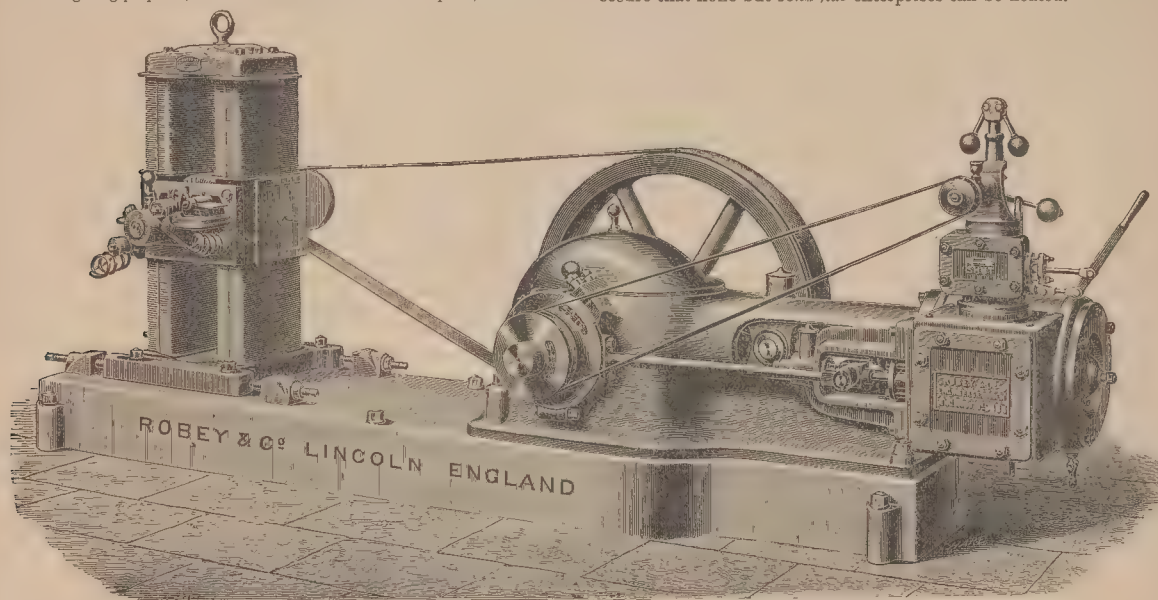
saving in labour. Nos. 1 and 2 are entirely distinct in character from the heavier and more expensive 26in. vertical and diagonal machine for steam power, also illustrated, but do their work in a most effective manner, in every respect, the patterns being cut evenly and quickly by the downward motion of the lever. Full particulars and prices of the machines can be had from the above firm on application. We should strongly advise merchants and manufacturers to invest in one of the appliances, as, by so doing, they can have their work done most expeditiously, and with great economy.



### Robey and Co.'s High Speed Engine.

The rapid progress made in the electric light is, in no small measure, due to the high state of efficiency to which the steam engines, for the working of the electric light machines, have been brought. Messrs. Robey and Co., of Lincoln, have designed a high speed engine specially for this purpose, but it has the advantage of being equally suitable for any other use where extra power is required in a minimum of space. It has been designed to work with a high steam pressure, and may be arranged to run at any speed from 150 to 250, as occasion requires. A good idea of the mechanism of the engine may be gleaned from the accompanying illustration. The whole of the wearing parts have large surfaces, and it is fitted up with means for self-lubrication, so that it may be run continuously, without any risk of heated bearings; and while every part is thoroughly well lubricated, it is so arranged that no oil is wasted. When specially made for electric lighting purposes, it is mounted on a cast-iron base plate, the other

for a year or two by means known to these promoters, during which time they managed to sell the shares, which they had taken as a decoy, and to leave the company in other hands. Of course, this system of multiplying mills, when there is not full employment for those previously existing, must, as Mr. Sidebottom observes, tend to ruin the shareholders, swamp the whole trade, and bring down the rate of wages everywhere; and the remedy he suggests, in order to bring about an improved state of things, is that the law be altered so as to restrict the borrowing powers of these companies to a certain proportion of their paid-up share capital. He would not say exactly one-third, as in the case of a railway company, but at all events there ought to be some restriction, so as to secure that none but *bona fide* enterprises can be floated.



end of which carries the dynamo. The base plate is provided with lugs and adjusting screws, so that the driving belt can be tightened without stopping the machinery. The engine is perfectly balanced, so as to run at a high speed without excessive wear, and the whole forms a strong, durable, and compact motor, which can be thoroughly relied upon to work economically and safely during long runs without giving trouble. It is made in two sizes according to requirements—either vertical or horizontal—and particulars of space required for either size, including accessories, can be had of Messrs. Robey and Co.

### The Limited Liability Act.

Addressing his constituents recently at Stalybridge, Mr. T. H. Sidebottom, M.P. for the borough, after speaking of the various causes assigned for the great depression in trade which has prevailed so long over the whole country, and particularly in the cotton districts, turned his attention to the subject of Limited Liability Companies as at present existing, and gave it as his opinion that it was useless to expect any return of permanent prosperity in the cotton trade, and in the various subsidiary trades dependent upon it, until an alteration is made in the laws regulating these companies. He called the attention of his hearers to the fact that, if any other joint stock company applied to Parliament for an act, their borrowing powers are limited to one-third of their paid-up share capital—consequently the money has to be subscribed in a honest manner, and no *bogus* companies can be started. But, under the Limited Liability Act, no such restrictions are imposed, and the result is that, in some cases, the *loan* capital of such firms exceeds the *paid-up* share capital by many times the amount, and numbers of mills have been built that were not required by the trade at all, but have been raised for no other purpose than to serve the interests of the promoters, and they have been made to pay

### The Lace Trade.

#### THE GROWTH OF FOREIGN COMPETITION.



SPECIAL Commission of the *Nottingham Weekly Express* has recently been procuring evidence bearing upon the stagnation of the lace industry in Nottingham. Amongst the evidence is that of an extensive machine maker and, in referring to the growth of foreign competition, he remarks that, so far as our staple industries are concerned, local manufacturers were able to hold their own so long as trade was progressive, and depended on the talent of a few men, who made frequent improvements in the machines and fabrics produced by them. Such was the case in the hosiery trade a few years ago, before Cotton's machine came out. The rate of progress in both lace and hosiery then was such that 20 per cent. was not too much to deduct in one year from the value of machinery, which was gradually superseded, or was undergoing material alteration. When, however, the machinery and manufacture became perfected, and invention could only be expected to introduce minor improvements, the question of foreign competition resolved itself into one of capital and management. Foreigners come over here, and finding that they can not only buy the same machines that are used in Nottingham, but can take back a sufficient number of skilled workmen to work them, they are in as good a position as any manufacturer in Nottingham. In some material respects, indeed, the foreign manufacturer has an advantage, especially if his home market is a good one, and he is protected by a duty of from 20 to 40 per cent., for he can, in addition, employ labour much cheaper than can be done here. Continental workmen, as a rule,



either work longer hours for the same money, or the same hours for less money. The cost of production abroad is therefore less, and if the foreign manufacturer has much stock left over after supplying his own native markets, he can afford to job his surplus goods at an extremely low price in the English markets, to the detriment of our trade.

**LEVERS MACHINES.**—So far as the making of Levers lace machines is concerned, Nottingham has still a practical monopoly, but that advantage may not last very long. Owing to the delicacy of the work, chiefly in the bobbins and carriages, we are able to build these machines and sell them next door to some of the foreign machine makers. So far as the embroidery or shuttle machines are concerned, the Swiss and German makers enjoy a practical monopoly. Asked whether the Levers machines could not be used for other kinds of goods than those hitherto manufactured upon it, the witness (if we may so call him) replied that the lace machine could, no doubt, produce a greater variety of work, but it could not compete with the loom in swiftness and cheapness for certain classes of work. The difficulty in varying the style of work done by the Levers machine did not arise from the character or capacity of the machine itself, but from want of skill and knowledge in connection with the "meshing" and thread combinations. He held that this showed the necessity for a weaving school in Nottingham, such as existed in Leeds, Bradford, and many other English towns, as well as on the Continent. Most of the French manufacturers were themselves clever lacemakers, and some of them had suggested the addition to machines, which they ordered in Nottingham, of certain appliances and improvements of which Nottingham manufacturers did not know the use. They produced a greater variety as regarded width and patterns, including some large showy embossed patterns which were not made in Nottingham.

**THE SCOTCH CURTAIN TRADE.**—In reply to further questions, it was stated that, although foreign manufacturers had, to a large extent, superseded the use of Nottingham lace, the effect was not injurious to the general interests of the lace industry, since foreigners, by producing a greater variety as regarded width and patterns, really extended the uses of lace, and so increased the demand—an increase of which Nottingham must in due time share the advantage. Meantime the curtain trade was day by day going to Scotland on account of the cheaper labour. The former Scotch manufacture of muslin curtains was beaten out of the market by lace, and they were now recovering it in the making of lace curtains. In Scotland, a manufacturer with £80 machines could get them worked for about £1 per week each, whereas the Nottingham manufacturer would have to pay twice that rate. The difference in wages thus represented a handsome profit. The Scotch manufacturer could get his machines here just as cheap as any Nottingham man, with the exception of the carriage, which of course he had only to pay once. No Union, either of masters or men, could long alter or check the natural course of trade. In prosperous times there were something like a dozen new machines started in Nottingham every Monday morning, which meant each week a demand for 24 additional men to work them; but wages rose very high, and now the trade was, to a large extent, leaving the town. The witness added that after a time he believed that the work would be done as cheaply here as anywhere, for he was convinced that the Union must eventually allow freedom of contract. What was most wanted here was, not an improvement in the machines but, improvements in the fabric. The Levers lace machine possessed capabilities never yet called into play, although many foreigners showed more invention and initiative than our own people.

### The Proposed Yarn Agency Scheme.

An Oldham correspondent writes:—An adjourned meeting is shortly to be held in Oldham to further consider the feasibility of establishing a limited yarn agency in Manchester, on the same lines as the Cotton Buying Company. The weakest point in the proposed scheme is supposed to be the home trade element. There seems to be a general consensus of opinion that an agency would succeed if it confined its operations to the export trade. From what has already been said on this subject, however, there seems as much necessity for an agency in the home trade as in the export trade. Moreover, it seems likely that

the home trade will have to be made the means of promoting and securing an export trade. Everything seems in favour of the scheme as regards facilities for carrying on a moderate business. The small expenses of establishment, the enhanced value of the yarn as compared with that of cotton, the 1 per cent. of Manchester as compared with the ½ per cent. of Liverpool, all tend in the direction of the feasibility of the scheme. It is estimated that if the 80 limited companies of Oldham sold one skep each per week through such an agency, on the usual 1 per cent. terms, it would pay establishment expenses, and place the agency in a position for establishing a correspondence with foreign customers. The capital required for such an undertaking would be but small, as the agency would not in any way complicate the question of principal and agent, but would merely act in the strict capacity of intermediary between buyer and seller, thus settling a question which, under present circumstances, does not appear to be within the power, even of the judges of the land, to settle. On the question of an export trade, some practical suggestions have already been made from abroad. Spain has recently opened its markets to English cotton yarns on most favoured nation terms. One of the English consuls there suggests the establishment of sample rooms for British manufactures to be attached to, and in connection with, Her Majesty's consulates in the more important commercial cities in each foreign country, such establishments to be under the supervision of Her Majesty's consuls. Among the specimens which might be comprised in such a collection of samples, he mentions particularly cotton yarns. He further suggests that a clerk appointed by the consul for the purpose, should take charge of, and catalogue, such articles as might be sent for exhibition, and that he should be in attendance at convenient times, to afford visitors information as to the cost of the articles at home, and the probable expenses of carriage, duty, &c., and also to place intending purchasers in connection with the manufacturers. He says the cost of such an establishment need not be great, and he thinks it might be defrayed by the contributors. This is a practical suggestion, and more than half bridges over the difficulty of establishing a foreign connection. Of course, due caution would have to be used in dealing with foreigners, but if business can be transacted on safe terms between the English cotton spinner and the American cotton factor, there is no reason why this difficulty may not be overcome in this case. One thing is felt to be a reflection on the enterprise and commercial intelligence of Oldham, and that is that its foreign trade, representing 85 per cent. of its cotton productions, is almost exclusively in the hands of foreigners, who for a long series of years have been colonising Manchester. It is felt that this must be corrected, and the success of the Cotton Buying Company in Liverpool, despite every possible opposition, is an augury of success in Manchester under what are deemed to be more favourable conditions.

### Cotton Spinning in India.

The observation made by Her Majesty's Consul, Mr. J. Troup, that Bombay yarns appear to be supplanting English-made yarns in the consumption of the Hyōgo and Ōsaka Consular district, is worthy of careful consideration. A decrease of deliveries in English yarns from 4,198,300 lbs. in 1884 to 2,328,800 lbs. in 1885, accompanied as it is by a corresponding increase of imported Bombay yarns, is a fact which, standing itself and alone, might well cause careful inquiry; but instead of being exceptional, we meet everywhere, in the East, the phenomenon that Indian yarns successfully compete with, and gradually supplant, the English-made article. In the Calcutta market, both have met as competitors, and since 1880 the relative position of English and of Bombay yarns has been exactly reversed. In 1880, there were imported to Calcutta 17,301 bales of English yarns and 14,047 bales of Bombay yarns, but in 1885, Bombay imported 17,287 and Great Britain only 14,912 bales. The same, or rather a still greater, relative change is to be noticed when we examine the trade reports for Hongkong. In 1875, among the imports of 16's-14's yarns, there were of Bombay yarns 30,000 bales against 16,000 from England; in 1877 there were 16,000 Indian bales against 12,000 from England; and while in the five years after 1877, the number of Bombay bales imported was 20,000, 40,000, 39,000, 55,000, and 75,000 respectively, the imports from Great Britain remained virtually stationary, showing the corresponding numbers of 13,000, 12,000, 19,000, 15,000, and 11,000 bales. The Bombay manufacturers enjoy, of course, advantages such as arise from the perfect security to life and property which, under English rule, has always been extended to India in as full a measure as to any other part of the British Empire. Improved spinnings consequent on the introduction of English machinery, directed by English intelligence, have given to India's manufacturing interest and to her export industry an impetus such as has arrested the attention of merchants and statesmen throughout



the world. Add to this all the advantages naturally realised by an abundant supply of cheap and willing labour and it becomes tolerably evident why Indian competition has of late become so formidable, not only to the United States and Russia, but also, to Great Britain herself in markets which she had formerly practically monopolised. Over and above all these natural advantages, surely formidable enough, there has been a steady, and as yet unarrested, decline in the gold-value silver in the money markets of the world; and as long as this decline continues to be equivalent to a premium on exports, we may look forward to an increase rather than to a relaxation of Indian competition in the markets of Eastern and Southern Asia.

### Fashions in Ladies' Materials.

The new woollen materials are remarkably light in texture, and will be favourite material for all day-gowns. Many are striped, some with velvet, satin, or plush; others have a raised bouclé pattern of spots and stars. The stripes differ in this way from those worn last season, for many are as much as three or four inches in width; others are effected by a union of long threads of silk, and quite a novel effect is given by cords as stripes, giving the impression of lines of braid stitched on to the foundation. Other novelties are cloths called "Pean de Suède," woollens with velvet plaids on the surface; Zibeline, a soft cloth like angola; and a kind of loose serge, called sackcloth, to be had in such colours as navy blue, grey, and mordoré. Many of the heather mixtures are flecked with loose silk or wool in a bright colour; and checks in two colours are made up with plush in the darker colour for the skirt. Nearly all the new silks and velvets display a brilliant combination of colouring, such as blue and red, green and red, on a grey ground. The Velours du Nord is brought out this season with bars interwoven of distinct colouring, and tufts of darker tones than the ground. The combination of colours is most successful: a crossbar of plush frisé in tabac will be seen on a foundation of electric faille. The checks are all taken from plaids. These rich fabrics are intended to be used for the entire skirt, over which is draped cashmere or plain faille. A new material, a kind of Chinese silk, called "sunshing," is to be had in many artistic shades, and is very much used for tea gowns and tea jackets; it is a thin silk which drapes well, and is very pretty and serviceable. Many of the woollens are very elaborately embroidered, and will be made up with the skirt edged with a deep embroidered border, and the bodice embroidered in a point back and front.—*Ladies' Gazette of Fashion*.

Stripes and checks—stripes of all widths and checks of all sizes, are to be the order of the day. Striped velvets, striped silks, striped woollens; checked silks, checked velvets—the changes are to be rung on these in bewildering varieties of harmony during the coming season. The new striped velvets are exceedingly pretty, some of them have the ground of soft corded silk, which is very effective; the stripes are often shaded at the edges, or have a shot effect; these form a novelty likely to be in great demand. Striped plushes—some with a velvet, some with a silk ground—are also seen with the same shaded or shot appearance; and these are even more charming than the velvets. Some of these rich striped fabrics have a curious mixture of colours, especially those designed for evening wear, but it must be remembered that these are only used sparingly, as panels, or at most as trains for evening toilettes. For medium use we have seen some nice tones of grey, in pearl and mouse shades, on which appear narrow lines of golden brown or old gold, which are very effective when mixed judiciously with plain material to match. Some of the new frisé velvets, too, are very elegant, the pattern displayed on the smooth surface being remarkably elegant, and even lacey-looking. These are produced in all the leading colours. In checks, the favourite material appears to be plain cashmere with large checks of plush. Some of these, especially those in soft, subdued tones, are very elegant; others, such as Scotch plaid patterns on a black ground, are a little bewildering in effect, and not a little "trying" to the wearer.—*Le Monde Elegant*.

Tissues striped to form large checks of different sizes are much employed for complete woollen costumes. The undershirts and plastrons are made of the patterned material, whilst the long skirt tunic and waistcoat corsage are of plain woollen stuff. Little or no ornamentation is now seen on such costumes, this being supplied by a combination of two fabrics entirely of wool, and of different colours, embroidered vignettes excepted, yet these are no longer very new.—*The Season*.

### The Jubilee Imperial Institute.

Many statements have been published, and various opinions expressed, regarding the re-opening of the Indian and Colonial Exhibition, at South Kensington next year as an Imperial Institute, which shall serve as a memorial of Her Majesty's Jubilee. It is therefore interesting to notice that an official announcement has been made that His Royal Highness, the Prince of Wales, has thought it desirable to request a number of public men to form themselves into a committee for the purpose of assisting in framing a scheme upon which to found the proposed Imperial Institution for the Colonies and India. Such body will confer with the official Colonial representatives, and will endeavour to lay down lines for the constitution of the institution which shall be acceptable to the Queen's subjects at home and abroad. The labour of the committee will be confined to action of a preliminary character, and it is not intended that the committee should be regarded as representing the governing body of the institution when established. The committee includes several well known noblemen and gentlemen, and when we state that amongst these are Sir Bernard Samuelson, M.P., President of the Chamber of Commerce of the United Kingdom, and Mr. J. H. Tritton, President of the London Chamber of Commerce, we may reasonably expect that the Imperial Institute may be founded upon a commercially beneficial basis, for it is in this direction that the best results might be attained. In our opinion, the South Kensington Museum amply provides all present requirements in art. It is a scheme to improve our commerce to which the committee should direct their attention. The Court of the Clothworkers' Company have voted £2,500 towards the Imperial Institute for the Colonies and India, believing that such an institute, "broadly conceived and wisely constituted and administered," under the direction of the Prince of Wales, will most appropriately celebrate the Jubilee of Her Majesty's accession to the throne by embodying in a permanent memorial the great characteristic of Her Majesty's reign, the growth and development of our great colonial Empire. It is understood that the Royal Commission of the 1851 Exhibition is about to hand over to the Jubilee Imperial Institute Commission the grounds at South Kensington, as its contribution towards the new Institute.

### ODDS AND ENDS.

A public meeting of the leading Glasgow citizens, under the presidency of the Lord Provost, was held recently, to consider the advisability of holding an exhibition in that city in 1888, and whether it should be an international or a Scotch national one. It was resolved, by a large majority, that it should be international, and the site was fixed for Kelvingrove Park. The covered space will occupy 8½ acres and the grounds 39 acres.

The silk manufacturing interests are highly pleased over the unexpected development of the industry in the United States. Manufactured silk goods have declined from \$34,000,000 in 1884 to \$26,000,000 during the past fiscal year. Raw silk imports increased 40 per cent. in the same time. The decrease in the value of imported silk goods was 38 per cent., in ribbons 52 per cent., and in braids and bindings the same. Sewings and twist production has increased from 12 to 15 per cent. The trimmings made in home markets suit them much better than imported goods. Many new mills have been built, and numerous extensions have been made.



### Receiving Orders.

Cousins, H., Clarke's Factory, Wycliffe Street, New Basford, Nottingham, lace maker.  
Jackson, Sarah Ann (trading as J. Jackson and Co.), 34, High Pavement, Nottingham, lace manufacturer.

### Adjudications of Bankruptcy.

Barton, T., Brunswick Mills, Sutton, near Macclesfield, Cheshire, silk manufacturer.  
Frost, J., 55, Blossom Street, Manchester, silk manufacturer and finisher, &c.  
Perkins, T., 64, Cannon Street, Manchester, silk manufacturer.

### Dividends.

Baxter, J. (trading as J. Baxter and Co.), late 23, St. Paul's Street, Leeds, Yorkshire, now 120, Beeston Road, Leeds, late woollen merchant, now woollen buyer, 1/4d. (second), Official Receiver's Office, 22, Park Row, Leeds.  
Ellington, H. R. Aldred, J. T., and Ellington, H. L. (trading as Ellington and Son), 13, Friday Street, London, warehousemen, &c., 1s., at the Offices of the Trustee, Mr. F. H. Collinson, 99, Cheapside, London.  
Johnson, A., 19, Queen Street, Leek, Staffordshire, silk broker, 7/4d., Official Receiver's Office, 23, King Edward Street, Macclesfield.

### Dissolutions of Partnership.

Ash, J., Ash, S., and Ash, L., Leeds, Yorkshire, woollen merchants.  
Bowes, J. L., Adam, John Isabel, Waterhouse, J. B., 11, Dale Street, Liverpool, wool brokers and commission agents.  
Boyd, W., and Boyd, A., Victoria Mills, Holbeck, Leeds, Yorkshire, cloth finishers.  
Burkhardt, L. R., and Oswald, J., Oxford Mills, Blackburn, Lancashire, silk merchants.  
Gillett, F., Gillett, R., and Rowland, F., 34, Jewin Street, London, silk manufacturers.  
Moss, D., and Wilson, M., Ossett, Leeds, rag merchants and mungo manufacturers.  
Shackleton, R., Pickles, W., Helliwell, Y., and Sutcliffe, R., Salem Mill, Hebden Bridge, Yorkshire, fustian weavers.  
Wilson, T., and Dixon, R. H., 22, Longston Buildings, Cannon Street, Manchester, check and gingham merchants.

## PATENTS.

### Applications for Letters Patent.

Actuating healds or harness in looms. J. Ingham, W. Sagar, W. Simpson, and N. Coates, London. 6th Oct. 12,723  
Attaching cams to the screws of gill-boxes used in the preparation of fibrous materials, and to similar screws used for other purposes. W. Walton, Skipton-in-Craven. 22nd Oct. 13,486  
Beaming machines. J. Bradshaw, Bolton. 25th Sep. 12,206  
Bolt-fastener for connecting the ends of driving belts. J. Jackson, Glossop. 29th Sep. 12,337  
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## Notices.

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## Indian Silk Culture.

Being a Paper, on the Silks in the Indian Silk Culture Court at The Colonial and Indian Exhibition, read in the Conference Room on the 24th of June, 1886, by THOMAS WARDLE, F.C.S., F.G.S.

(Concluded from Page 50.)



IN the French report of the Lyons Silk Laboratoire for 1885, of which I shall say more shortly, is the drawing of a new Chinese bivoltine wild silk-moth, feeding on the mulberry tree, which Mr. Moore has named *Rondotia Menciana*. This genus is a new one, and is so named by him as a souvenir of the important works on silk of my old friend and former president, Monsieur Rondot. The specific name is to recall to recollection the old Chinese philosopher Mencius. It may turn out that the term "Mori" may have more of a generic significance than specific, indicating simply the mulberry feeders. In fact, there is some doubt as to whether we really know what *Bombyx mori* means, or whether it exists at all. I feel certain there is a great difference between the mulberry feeding silk-worms of Bengal and the so-called *Bombyx mori* worm of China and Japan, which is the kind now being acclimatized in North India. The extraordinary difference seen in the respective cocoons shows this plainly enough. The Bengal worm I consider to be exactly suited to the Bengal climate. I do not believe they can be acclimatized in Cashmere, the Panjaub, the N.W.

Provinces, or in Assam, but without doubt the *Bombyx mori* can, and it is the proper worm to try there. Whether they have structural differences sufficient to be *specific*, I must leave to entomology and biology to determine. If they are not *specifically* different, there is sufficient divergence to group them as distinct varieties of the Mori, and, I repeat, they are exactly suited to those parts of Bengal where they are found, and through which, for the most part, the Ganges flows. I believe also they are indigenous to this part of India. It may be useful here to state that the Bengal silk-worm of the rainy and hot weather bund, or season, is called locally the Nistry-poloo and Madrassee worm; that of the November or cold weather bund, or season, is called the Desi or Chota-poloo worm; they are designated by Mr. Wood-Mason respectively *Bombyx crasi* and *Bombyx fortunatus*, though, perhaps, only provisionally.\* Concurrently with this branch of enquiry, I most strongly advocate the commencement of a structural one, such as has been started in Lyons, and that the fibres of all kinds of cocoons should undergo systematic examination and be recorded. In this way, one inquiry will help and strengthen the other. To be of practical and industrial use, both should be conducted simultaneously; for all manufacturers here will, I am sure, agree with me that it is of the first importance that the strength, elasticity, and thickness of fibres shown be known, as well as their varying states in health, disease, and changing climatic conditions. The importance of this would soon be seen in the comparison of Bengal silks with those of Cashmere, the North-West Provinces and the Panjaub, and valuable information as to climatic conditions obtained. From these, comparisons with the better known silks of both East and West would be made, and important data established. In England, we have done nothing which may be considered to be strictly scientific in silk work. Fortunately we are not long behind France, and I hope Mr. Buck will influence the Government of India in this direction. Besides these points, we do not know much yet about the chemical composition of silk and its gum, or about its properties of combining with other substances, whether as dyes, mordants or adulterants. I am at present at work on spectrum examination of dyed silk and dyes, and on chemical methods for the detection of the amount and nature of the weighting matter too often found in combination with silk. The whole subject entails too great a sacrifice on individual enthusiasm. It wants lifting into the sphere of methodical and scientific work, and no one can then doubt of its ultimate usefulness to the silk industry and its entourage. The importance of this suggestion, which I desire so much to press at this opportune moment, I may well further emphasize by mentioning that this week I have received from the Lyons Chamber of Commerce the report for the year 1885 of the Administrative Commission of the Laboratory for the Study of Silk, lately founded by this Chamber. It contains three plates of silk-worms, their cocoons and moths, two of them new. Amongst other things, I am pleased to observe the prominence given to my examinations for this Chamber of Commerce of the strength, elasticity, and thickness of a large number of silk fibres, which, with the results of their own laboratory, occupy no less than thirty-six pages of the report. I only mention this to show the high importance the Chamber attaches to all that relates to fibre construction. The expenses of this laboratory work have not exceeded £200, which was the estimated sum voted. Is it not time we did something in this direction? America, without any real sericulture, but with a rapidly extending silk manufacture, boasts of a splendidly conducted silk journal, whilst England remains without one. I feel sure the only way to recover a leading position is to commence original research and collective action and effort. We have trusted too much to individual enterprise and effort. This, without collective action, will never get us into the front, or even into a respectable position as compared with France, and both the products of England and India will continue to suffer in comparison with those which are perfected by the leaven of applied scientific research. That there is a great future in store for sericulture in India is beyond doubt, and it only the same energy were

\* It is these worms which produce the Bengal raw silk of commerce.

applied as that brought to bear on the production of Indian wheat and Indian tea, the day would not be far distant when the silk centres of Europe would desire the silks of Bengal as much as they now do those of China and Japan. That India should take a fair position in the supply of the world's demand for silk is not for Englishmen to gainsay. On the contrary, India, with a greatly increasing population, the natural result of a great Continent at peace with itself, and a growing security from depopulation by famine, an improved sanitary administration and more scientific medical enlightenment and instruction, it goes without saying that Englishmen, of all others, should feel the greatest possible interest in the material welfare of India, and especially in everything which tends to the organisation and stimulus of her varied industries, particularly one which is so capable of being so widely spread as sericulture. Tusser silk, as adapted for export, has been, during the last ten years, very slow in taking root in India, and large supplies have had to be obtained from China to meet the gradually growing European demand. At the Paris Exhibition of 1878, Sir Philip Cunliffe-Owen determined to give this silk an opportunity of asserting itself, and afterwards, in the India Museum, he took care that its capabilities and uses should be conspicuously depicted. Not a little of the industrial growth of this useful, though wild silk, is due to his encouragement, and now in this Exhibition can be seen the fruits of all the care which has been bestowed upon it in various ways, and I am more than pleased to state that India now has an enormous demand. A number of gentlemen in India are vying with each other to improve the methods of reeling, and with singular success. In the cases set apart for Tusser silk are shown results which a few years ago would have been thought to be impossible. Already this silk is capable of far more extended uses than ever before, and although it cannot be expected, on account of its structure and properties, to take the place of the more beautiful silk of Bombycidae, it has its uses, and those in a much higher degree than it was ever thought susceptible of. Besides the silks already mentioned, there are others, such as the Eria silk, obtained from the *Attacus ricini* silk worm, which will gradually find extended utility; and great lessons will be learnt by those who care to observe, in these varied exhibits, not only in the reeling of the cocoons, but in the spinning of the waste fibres, and the dyeing and weaving of the silks. On both sides of the Ganges, Bengal is capable of producing silk to a vastly extended degree, sufficient for all the requirements of India, which are really very great, for weaving, embroidery, and for minor purposes, as well as for a greatly increased export trade. Under European careful supervision, the native Indian works beautifully. He cares more for patient manual labour and real handicraft traditional work than he does for progressive thought or invention, and it is not to be wondered at that it has been left to the quicker brain and the desire for development that characterises the people of the West, to produce results which find a readier market than his own unaided and unguided efforts can secure. I have spoken before of our responsibilities with regard to India, and I am glad to be one of those who feel more for India in those respects which relate to produce which we can buy from her than in those which we have to sell to her. To see the exports from India grow is a duty we owe to this beautiful country, and we should be gainers thereby. Such a practical and unselfish regard for her welfare would constitute the strongest bonds of Empire Federation, and enable us to look upon our Indian fellow-subjects more in the spirit of the now-a-days too rusty Christian precept of loving our neighbours as ourselves, happily embodied and expressed by Mr. Edwin Arnold in his sonnet preface to his "India Revisited."

The paper was illustrated by the aid of a dissolving view apparatus, by examples showing the enlarged microscopic appearance on the screen of the (1) Typical mulberry silk; (2) Mulberry silk *baves* of unequal diameter. The *bave* is the double thread as deposited in the cocoon by the silk-worm. The *brin* is either of the single threads or fibres composing the *bave*. The *bave* and, consequently, the *brins* vary in diameter in the same cocoon, being thinner in the first and last portions reeled and thicker in the middle. The two *brins* are often found to be of unequal diameters, and this occurs

mostly in the first and last portions reeled from the cocoon; (3) Silk from cocoon of the *Madrassee* or *Nistri poloo* silk-worm of Bengal (*Bombyx crasi*). Rainy and hot weather bund; (4) Silk from cocoon of the *Desi* or *Chota poloo* silk-worm of Bengal (*Bombyx fortunatus*). November or cold weather bund; (5) Silk from the cocoon of the mulberry-fed silk-worm of China; (6) Silk from the cocoon of the Tusser silk-worm of India (*Antheraea mylitta*); (7) Silk from the cocoon of the Tusser silk-worm of India (*Antheraea mylitta*), showing the form in which the silk is laid in the cocoon by the silk-worm; (8) Tusser silk, dyed black; (9) Silk from the cocoon of the Muga silk-worm (*Antheraea Assama*); (10) Silk from the cocoon of the Eria silk-worm (*Attacus ricini*); (11) Silk of the spider *Nephilengys malabarensis*, Walck, found at the Lake of Bhim Tal, in Kumaun District, North-Western Provinces, by J. F. Duthie, Esq., of the Botanical Gardens, Saharanpur.

## Our Industrial Race with Foreign Countries.

LECTURE BY MR. SWIRE SMITH.



At the Huddersfield Technical School, a few days ago, Mr. Swire Smith gave a lecture on "Our Industrial Race with Foreign Countries." He remarked that the existence and stability of our empire depended upon the prosperity of our manufacturing industries. The success of British productions in the past had been secured by their cheapness and excellence, and their success would, in the future, entirely depend upon the same qualities. When British products were undersold, it would be by the greater cheapness and excellence of the products of other countries. If by ignorance, idleness, lack of inventiveness, failure to adopt the inventions or improvements of others, or by the wastefulness of our resources, we fall behind, we allow our rivals to strike at the very source of the nation's life. To be temporarily undersold meant loss and suffering; to be permanently undersold meant commercial ruin. If the great factories and workshops of the northern counties of England were to be closed, and the workpeople thrown out of employment, the distress would not simply be local. Our foreign trade would immediately wither and decay, the British flag would cease to float proudly as now over every sea, the customs duties, which were raised from the labour and wages of the people, would no longer be forthcoming. One gigantic legacy only—our national debt—would remain, a sublime monument of the troubles and follies of our ancestors. England's manufacturing industry was England's fountain of life, and upon the equipment—the physical, intellectual, and moral strength of Englishmen and women—would depend the position which we, as a country, should take in our industrial race with foreign nations. As regarded mineral resources, situation, means of transport, wages, leisure, cheapness of food, clothing, and lodging, we stood first in Europe; but we were behind some countries in the matter of education. Whilst, however, he gloried in these advantages, he had to yield to Continental superiority in the matter specially of scientific and technical education which helped the scholar to earn his livelihood. Technical education consisted in knowing the why and wherefore of their work, and of the principles underlying and affecting it; and he was disposed to think that the theoretical side of the work had been strangely neglected in England, because, so far as manufacturing was concerned, for many years the necessity for its cultivation had not been felt. Previously, it used to be that lads who wanted to learn a trade were sent at once into the workshop, but now it was ascertained that the man who combined workshop practice with scientific and theoretical knowledge became infinitely more valuable than the man who relied on manual training only. The national provision and endowments for higher education were most unequally distributed as between the professions and trades of the country; but in France, Germany, Austria, Belgium and Switzerland, in addition to technical colleges for doctors, lawyers, and divines, there were colleges for engineers, chemists, architects and builders, designers, dyers and manufacturers, merchants, bankers, and agriculturists. In France and Belgium, the municipalities provided free evening schools for drawing and modelling of a character which put into the shade the art schools of this country. These schools were attended by tens of thousands of clever and enthusiastic students, who had received rudimentary training in the day schools, and who, after twelve hours' labour in factory or workshop, came to the evening classes that they might improve their knowledge of drawing. Relating his experience of these schools, Mr. Smith remarked that what impressed him specially was the practical character of the instruction, and granting that the elements of drawing and science were taught universally to our English children, he would ask for nothing better in Huddersfield, and in the Yorkshire and Lancashire towns, than free night schools, such as he had referred to, attended by young men from the machine shops, building works, factories, warehouses, and small trades. For handicraftsman, he asked for no higher technical education with the workshop by day for the practical application of the theoretical studies of the class-room. He advocated the teaching of technical subjects by practical men, and pointed out that technical education of this character was no new fangled theory of foreign invention, for the foreigners learned it from us, and imported it with our machinery. Mr. Smith gave a graphic sketch of the rise and progress of our manufacturing industries, and he hoped the students attending that school would never forget that they had not simply to contend against



foreigners, be they German or French, but against their rivals of neighbouring towns—nay, against those of their own town. The English manufacturers did not pretend to excel in the rich silks and velvets of Lyons, in the high-class cashmeres of the north of France, or in the tasteful ornaments and fancy articles of Paris, Dresden, and Vienna, but claimed to be the manufacturers for the million all the world over, and in this respect England's position was unrivalled. Trade was easy and profitable, and we secured our connections by the cheapness of our productions. What mattered if the designs were ugly, the colours hideous, the dyeing and printing loose and bad? They had no rivals, and so with all their faults, they were accepted East and West. Who cared about providing new patterns so long as there was plenty of demand for the old ones, and some manufacturers, in their greed for profit, were not in the least concerned as to whether or not their razors would shave so long as they would sell. It would be unnatural to expect that our manufacturing prestige should remain unchallenged. Foreign manufacturers bought more and more of English machinery, they employed English architects for the erection of their factories, and English foremen for directing them. They adopted our methods of manufacture and organisation, and they copied from us every good thing that we could teach them. They found it was useless for them to compete with us in machinery, as they bought English machinery and modelled from it; and they redoubled their efforts in cultivating the faculties of their men. They all knew with what results; they found foreign goods competing against those of England, not in neutral markets, but in their own. It would almost seem as if there had been a combination on the part of all the manufacturing countries in the world, some of their own Colonies included, to boycott the United Kingdom by shutting out their manufactures, as far as hostile tariffs would enable them to do so. The first effect of this movement upon the protected countries, and upon England, was to give a great stimulus to the export of machinery, mill, and workshop appliances, and raw and semi-raw materials, from England. To that extent certain branches of English trade had materially benefited. Having obtained their machinery, their rivals first began to make the goods which were most easily made, and most readily sold, viz., the goods for the million. That had happened in every protected country, and English workpeople engaged in the production of those goods had been thrown out of employment, and, in many instances, manufacturers had been ruined. In every English industry, machinery had been displaced, and many manufacturers, rather than go to the wall, had changed the character of their productions, with results which, on every hand, were admitted to be in the highest degree satisfactory. In his opinion, inasmuch as the effect of foreign tariffs was concerned, they had seen the worst of the depression. Their manufacturers were, to some extent, recovering from the loss of the trade in staple products with protected countries, and he did not believe that for some time those countries would be able to compete with England in supplying the ever-increasing population of the non-manufacturing countries. In spite of protection, every market was a neutral market to those products not made at home. The leading men everywhere still looked to England for their apparel, and no goods enjoyed a higher reputation than did the coatings of Huddersfield. He had studied the evidence bearing upon trade depression, and in each Continental country and the United States and Canada, he had compared the position of the leading industries with those of England, and he had come to the conclusion that, apart from the agricultural depression, and the consequent migration to the towns of scores, if not hundreds, of thousands to swell the ranks of the unemployed, the trade depression had been less serious, and had caused less suffering, in England than it had in France, Germany, or Belgium, their chief manufacturing rivals. He had come to the conclusion that, where foreign supremacy existed, it was not due to low wages and long hours; and he was not afraid of the leisure of English operatives so long as they used it in renewing the force spent in their work, because the productive wealth of a nation lay in the strength of its artisans, and not in their starvation. Their wages and hours would get to Continental level if they could not otherwise compete with their rivals in cheapness of production of the articles wanted. They were powerless to permanently check the operation of natural law. Where foreign goods surpassed those of the United Kingdom, the causes were not due to low wages or protection, but almost invariably to some excellence in detail or superiority in taste, or to some scientific or chemical knowledge applied to the goods. In other words, and that was the kernel of the whole question, foreign excellence was found to be mainly due to the technical training so assiduously imparted in their schools, and which we had so assiduously neglected in ours. He had witnessed with dismay thousands of looms from Yorkshire at work in Germany, engaged in weaving yarns from Yorkshire, and he had been informed that the finished goods were being sent to England at the very time when similar looms in England were standing idle, and the weavers out of employment. The goods were being purchased in England, because in the German factories the designing was more tasteful, and the dyeing and finishing more effective, than was shown with regard to English goods; and this was the result of the training the designers, dyers, and finishers received in the technical schools specially provided by the legislature and municipalities. Their rivals were, in this instance, turning their own machinery and semi raw material to more account than they did themselves, because of their superior taste and skill in blending materials together; and he thought that no amount of protective duties would shut out many of the superior goods that entered this country. There were some people who complained of the large expenditure on education; but he should have thought that by this time everybody would have been convinced that it was not education, but ignorance, that was so costly. He had often heard it said, by leading men in Germany, that, were it not for their superior education, it would be impossible for that country to exist as a manufacturing state, in face of the competition of England. They in England were richer than any of their rivals, and yet were the most stingy in their educational expenditure. Whenever they saw superior foreign goods preferred to theirs in England,

they must remember that they surpassed them also in every civilised country, and that the same power of combining beauty with utility, which would enable them to beat the foreigner in England, would enable them to beat him in every country but his own. Was the object worth fighting for? If so, they must apply to commerce the principles invariably accepted in their military equipments, and meet science by science, efficiency by efficiency, whatever the cost may be. He would not quarrel with those who told them that to fall behind in the arts of war would be a national crime; but he maintained that to fall behind in the arts of peace would be national suicide. He asked for no engines of destruction, except such as destroyed ignorance, intemperance, dishonesty, and sloth. But he did ask that in the industrial race all obstructions should be removed from the course, and all weights that beset them laid aside. Finally, let them help each other in their difficulties, and unite in promoting the prosperity of their country, and their industrial position would not be endangered by the rivalry of foreign countries. In connection with the subject of technical education, so ably advocated by Mr. Smith, we place before our readers a few very startling facts relative to this teaching on the Continent. The Kingdom of Saxony contains a little more than half the population of London within the area of the Metropolitan Police, yet the people support 211 technical and commercial schools, attended by 12,000 students, and besides these there are 23 schools which teach special industries to 5,000 pupils, making in all 234 schools and 17,000 learners. The Chemnitz Weaving School, which has been established about 10 years, possesses a staff of 44 workmen, who teach 16 distinct trades, all of which are connected with the textile industry. This school is attended by manufacturers, factory inspectors, and professors, as well as by workmen, and there is no limit to the age of the students. Amongst the subjects of instruction, we may mention industrial design, the working of models, the knowledge and estimation of the value of raw materials, and the theory of mechanical weaving. There are great numbers of these institutions throughout Germany, but the most important are found at Berlin, Munich, Dresden, Carlsruhe, Charlottenburg, Aix-la-Chapelle, which turn out amongst them, annually, about 5,000 capable workmen and business men. Commercial museums also are claiming much attention on the Continent. In addition to those previously existing, one has been formed at Charleroi, and another at Liège (Belgium). At Liège the museum is divided into two sections, the first including imported goods, with necessary particulars attached to each—the second embracing articles for export, and also with instructions needful for exporters.

### The Possible Future of Indian Trade.

On the 29th ultimo, a lecture was delivered in Bradford, by Dr. George Watt, C.I.E., of Calcutta—the manager of the Indian Department of the Colonial and Indian Exhibition—on the above subject. The lecturer commenced by stating that the agricultural development of a country must precede commercial development, and he should adopt the line of argument, with reference to India, that the agricultural resources of India were by no means exhausted, and that, as they were developed, the commerce of India must necessarily be extended. After referring to the difficulties with which the Indian farmer has to contend, the lecturer spoke of the development of India as a trading country, and said that, before the English entered the land, the rivers were the only means of communication, as there were no roads of any importance, but with the introduction of railways, many and great changes had been produced. All the cities of India were necessarily, at that time, situated on the banks of the rivers, but since the opening up of British trade, some of the most important of these towns had been reduced to mere villages, because they were not suitably situated for our commerce, and other towns had been raised into importance, such for instance, as Kurra- chee, Rangoon and Madras, which had grown at the expense of Calcutta and Bombay, owing to the opening of railways in the Indus valley. The imports and exports of India, taken together, now amounted to a value of £152,000,000, as compared with a total of £660,000,000, the amount of the imports and exports for Great Britain. India was still far short of Great Britain in respect of the bulk of its trade, but was trying to reach up to it, and had already obtained the position of the fifth amongst the commercial nations of the world. Of the total of £152,000,000, £85,000,000 represented exports, and £67,000,000 imports. The imports of India were from £20,000,000 to £30,000,000 less than the exports, whereas in Great Britain, the imports were £150,000,000 more than the exports. Of the imports into India, £41,000,000 came from Great Britain, and of the exports from India, £37,000,000 came to England. He wished them to notice, from these figures, that while India was a very large market for England, this country was not a very important market for Indian export goods. The Indian people failed to understand how it was that the Continent was far more important to India for its export trade than England was. Of £15,000,000 imported into India in gold and silver in one year, £8,000,000 came from England, and he wished to point out that a very small proportion of that large sum was used for currency, by far the greater portion of the metal being hoarded. During the past five years, there had been imported into India gold of the value of £22,300,000, and silver of the value of £38,000,000, and in forty years a total of £340,000,000 had been imported in that form. It had been said that the British rule had done a great deal of harm in India, but he thought that the hoarding of precious metals to such an extent proved that that was not so, and that the people of India were becoming more wealthy. Apart from that consideration, the trade of India had increased enormously. The exports of oil seeds alone had increased from £4,500,000 to nearly £11,000,000. The imports of gold



had recently begun to fall off, and most people would admit that that was a very promising sign, as it seemed to indicate that the people of India were beginning to realise that the hoarding of gold was not the most profitable way of preserving wealth, and that investment in Government stocks, railways, and public companies was a far better plan. At the present moment, the Indians held £20,000,000 of the National Debt. There was another promising point about the trade of India as compared with that of Great Britain. The Foreign trade of Great Britain had declined during the past ten years to the extent of 0.6 per cent, taking the exports and imports together, whilst, during the same period, the trade of India with foreign countries had increased to the extent of 57.4 per cent., a higher increase than that obtained by any other nation in the world. The primitive systems of manufacture, competing with gigantic productive reforms, had gone to the wall. The Indians had taught the art of calico printing to Great Britain, and had also taught us how to make muslins, and then we had shown greater capability of production, and had sent these goods back to India. That was the effect of the steam engine, but that could not always continue in India. For some time, India had calmly submitted to sending its cotton to England to be manufactured. But what had taken place with regard to the jute trade of Dundee was about to happen with regard to cotton, and the cotton was now being dealt with on the spot. Mills had sprung up in India in which yarns and twists and broadcloth were manufactured, and these places were beginning to supply the Indian market to a great extent. Last year, £3,000,000 of yarns had been exported from India to China and Japan, and cotton warp of the value of £1,000,000 had been exported to East Africa, Aden, and China. There was not the slightest doubt that in the future these figures would be much larger. During the past three years, the imports of cotton goods from England to India had declined to the extent of £800,000, and the decline was not due to a fall in value merely, but as regarded the quantity of goods in yards and weight. After speaking of the various food stuffs of India, and the enormous increase in their production, and stating that it was an error to suppose that the wheat exported from India consisted of the food of the natives, which had been stored up for emergencies, and which was sold for greed or gain, (for, as a matter of fact, wheat was not grown as an article of food for the people, except in the Punjab, and a small part of the North-West Provinces,) the lecturer turned his attention to the imports of fabrics into India, and said that the Germans were driving Englishmen out in many directions, and America was also receiving a large share of favour. He attributed this to the stubbornness of the English manufacturer who had got his machinery made for a particular kind of goods, and would not alter it. The Englishman said if the Hindoo did not want his goods he must do without them. As an instance of what he meant, he took the iron trade. The natives used a kind of hoe in cultivating the field. They never used a spade, because they had no shoes, and could not bring the necessary pressure to bear upon it, and it was altogether against their habits. Yet the English manufacturers insisted upon showering spades upon the natives, whilst the Americans on the other hand had taken the Indian hoe to the States, copied it, and now supplied the Indians with the article which they were accustomed to use. The wool trade in India had only begun. Last year, wool of the value of £872,000 was exported from that country, whilst five years ago the trade only amounted to £700,000. The imports of wool had increased from £1,120,000 to £1,390,000. Five large woollen factories had started, and these were almost entirely engaged in the manufacture of a peculiar kind of blanket, of the colour and shape which was required by the people. A large and rapidly-increasing business was being done in that kind of trade. After a few observations on the silk trade of India, and the probability of the development of the usefulness of a native silkworm whose food was the castor-oil plant, and upon which Mr. S. C. Lister, of Bradford, and others, were now experimenting, he returned to the subject of crops. He said a great quantity of land was still available for crops, and it was only necessary to ascertain what particular kind of crop was wanted, where to get the ground for it, and then they could extend the agriculture of the country enormously. Then the sound of the steam engine would be heard, and year by year agriculture and commerce would advance together and hand in hand.

In a speech recently delivered at Macclesfield on "The Silk Trade," Mr. Wardle, of Leek, spoke of the proposed inquiry by the Government into the depression in the silk trade, and said that one of the duties of the Commission would be to ascertain why silk towns in England, if they had not decreased, had not increased in proportion to those on the Continent. We should then know the cause of the expansion of the Continental silk centres, and of the contraction of our own. With reference to the finishing of silk, inquiry was also needed, and Mr. Wardle spoke most emphatically on the great necessity for technical instruction in all branches of the silk trade, and urged the importance of Government grants being voted for schools for this purpose. He also compared the advantages possessed by foreigners in technical education with those of this country, and advocated the adaptation of schools of art to local industries, and the establishing of local museums and exhibitions of trade samples. He also advised Chambers of Commerce to press upon Government the absolute need of appointing a Minister of Commerce, and of commencing a laboratory of sericulture similar to that which had been opened in Lyons by the French Government.

## Art in Design.



THE first of a series of lectures arranged by the Textile Industries Committee of the Yorkshire College, on "Art in Design," was given recently in the Chemical Theatre of the College, by Mr. Lewis Day, Cantor Lecturer to the Society of Arts. The subject handled was "The Anatomy of Pattern," and those which are to follow deal with the distribution of ornamental design, the fitness of ornament, and the study of design. The series has been arranged with the object of extending a knowledge of fine art among the students of the weaving and designing school, in connection with which, classes for drawing are also to be established. Mr. Day's lectures come as an introduction to the course. Although the lectures are primarily for the benefit of the day and evening students, the committee have decided to throw them open to the public on the payment of a small fee. In the course of his opening lecture, Mr. Day said that pattern came of repetition. Many a pattern bore on the very face of it evidence that it had grown out of the necessity of repetition. They saw this very plainly in the chequer, which was the product of plaiting; in the lozenge or diamond pattern, which was anticipated in the meshes of the simplest form of netting; in the herring bone or zig zag, which was derived from basket work. Even the elaborate interlacing ornament of Arab art was based upon an arrangement of cross lines very much as might be seen in the common cane-bottom chair. It was more than probable that some mechanical necessity gave rise to all geometric pattern. Certainly, it was impossible to plait, net, knit, weave, or otherwise mechanically make, without producing pattern. It might be so small, as it often was in weaving, that the warp and the weft were invisible to the naked eye, but it was there, and all that remained was to efface it as much as possible, and to make the best of it. Out of the determination to make the best of it, had grown much of the most beautiful pattern work. To neglect this source of inspiration, therefore, to say nothing of the attempt to suppress it, would seem to be wasteful to the last degree. The very repetition of parts produced pattern, so much so, that, whenever there was ordered repetition, there was pattern. Any form repeated at regular intervals produced a pattern as surely as the recurrence of sounds would create rhythm or cadence. The distribution of the parts need not be regular. The wave marks on the sand, the veins of marble, the grain of wood, the crystallisation of the breath on the window pane, the very features of the human face resolved themselves into pattern. There was room for speculation, whether, with a view of escaping this danger, or anticipating it rather, the designer first took to the deliberate use of those masks and grotesque heads which form so prominent a feature in ornamental design. The popular idea of the process of ornamental design was that the artist had only to sit down before a piece of paper, and, spider-like, spin out the fancies that might crowd his fertile imagination. Indeed, there was scope in design for all his fancy; but he was no Zeus that ornament should spring, Minerva-like, full grown from his brain. Ornament was patiently built up on lines inevitable to its consistency—lines so simple that to the expert it was not difficult to lay bare its very skeleton, and to classify the pattern work according to its structure; to show affinity between groups to all appearance dissimilar, and, indeed, to point out how few were the varieties of skeleton upon which all the variety of effect was framed. For a man to make a repeating pattern without regard to its logical construction—as though in his domain there should be no skeletons—would be, from his (the lecturer's) point of view, a profoundly foolish thing, but more than that, it was impossible. He might design a unit in which there was no repetition and no formality, but the moment he repeated the unit, the very order of its repetition proved to be the cupboard, if he might say so, in which the skeleton would be found. It might be imagined that by designing in some such haphazard fashion, the artist would secure to his design a freedom of line and an absence of formality not readily obtained by adopting the more systematic method; but this was not by any means so. If a design were above the level of insignificance, there must be in it some dominant feature, which, when many times repeated, would appear more prominent than ever. It was to these features that the eye would be irresistibly drawn; it was the lines they took in relation to one another which would assert themselves. If lines had not been taken into consideration, it was not to be expected that they should come out satisfactorily, and as a matter of experience, they always came out awry. All must have suffered more or less from wall-paper and other patterns in which certain ill-defined but awkward stripes impressed themselves upon them, and they might have imagined that this effect of stripes came from working upon vertical, horizontal, or diagonal lines. But it was much more likely the result of not working upon definite lines at all. A designer, who knew his business, would make sure of lines not in themselves offensive, and would also counteract a tendency to stripes in one direction, by features diverting the attention afterwards, and would so clothe any doubtful line, that there would be no fear of it asserting itself, as in its nakedness it might—he saw the danger, and was forewarned against it. The mighty man of valour, who disdained to be trammelled by any such encumbrance, was without defence against contingencies practically certain to arrive. The overwhelming odds were that the petty considerations he had despised, would be quite enough to wreck any venture he had dared in defiance of them. Since, then, it was



practically inevitable that there should be definite lines in ornamental design, seeing that, if they did not arrange for them, they arranged themselves, it was the merest common sense to lay down those lines to begin with, and, in fact, to make them the skeleton or framework upon which they built up their patterns. The lecturer then proceeded to "dissect" certain designs shown, and explained the extensive use to which certain lines might, by modification and variety, be put, and in the course of his observations said that probably the vast order of patterns constructed upon cross lines was the first in point of time, as it arose inevitably out of the very primitive art of plaiting. They had not done away with construction, when they had succeeded in keeping the scaffolding out of sight. It was the equilateral triangle which was the most useful factor in design. Once they had the equilateral triangle, they had only to group the units to get the hexagon (a group of six triangles), the star (a group of twelve), and other shapes. Their scope was thus immensely widened, they having the basis of an infinity of geometric patterns, such as were found in Byzantine mosaic work, and in its Moresque derivatives. The octagon was not a unit which would of itself form a diaper, as the hexagon would; it was only in connection with the square, diamond, or other four-sided figure, that it would repeat. Nevertheless, this new series gave varieties of radiated patterns, as witness the elaborate interlacings of the Arabs, all of which, even the most magnificent, were closely related to the seat of a common cane-bottomed chair. In certain Arab patterns, where this ultra-elaboration of lines was employed, it appeared almost as if a new principle had been introduced, but, upon analysis, the designs resolved themselves into the elements already referred to. Pentagons formed a very respectable diaper, especially if enriched with five pointed stars. Shapes of any kind might be put together to form a pattern, but the lines on which they were arranged, or into which they faced, must be those laid down, which were, indeed, the basis of all possible pattern. For further variety in design, they must resort to the circle, but it, however, must be struck from centres corresponding to the points of intersection of lines such as had been described; and, in so far, it was only one of the innumerable arbitrary shapes that must be so arranged. Whether the idea of flowing forms first grew out of the circle, was of no great consequence. It was more than probable that instinct preceded geometric principles. Many of the common flowing patterns might be deduced from angular motives. However, the circle was familiar to man from the moment he first saw the sun or moon as discs in the sky, and the first pattern traced by man's hand may have consisted of circles. The circle with its segment, the curve and its compound the spiral, assumed extreme importance when they came to the consideration of the scroll. Having shown how the combination of straight lines and curves would do so much for the designer, he said that the Japanese sometimes went so far as to interrupt the pattern, wiping out a bit here and there, and thus anticipating the softening effect that age might impart. The basis of all repeated patterns was geometric, and it was therefore essential that the designer should be acquainted with simple geometric principles, as it was that a figure draughtsman should have some knowledge of superficial anatomy. The designer had not merely to invent pretty patterns, but such as could be conveniently worked. The lines mapped out for him, by the conditions of his work, were, in most instances, not just those which beauty have decreed. It was very unsafe to dogmatise as to the origin of a pattern, as there were always so many ways in which it might have been suggested. All things considered, the most useful skeleton to work upon was the diamond. It was on the basis of the diamond that "drop" patterns were most readily designed. The "drop" was a design by means of which the designer was enabled, without reducing the scale of his work, to minimise the danger of unforeseen horizontal stripes, a danger which was imminent, when repeats occurred always side by side on the same level. It was only by experience that a designer learned to know what might or might not be done within given lines. Many a notion turned out to be practically quite unamenable to the conditions under which the craftsman was working. Yet there was relief in the very variety of the efforts expected, and, in the presence of difficulties, ingenuity was excited. A designer must have pugnacity, and enjoy tackling a tough problem. A man proved himself a designer, not because he had somehow arrived at a design, but inasmuch as out of unpromising material, and untoward circumstances, he could shape a thing of beauty.

### Commercial Failures.

According to *Kemp's Mercantile Gazette*, the number of Failures in England and Wales gazetted during the four weeks ending Saturday, November 27th, was 420. The number in the corresponding four weeks of last year was 340, showing an increase of 80, being a net increase, in 1886, to date, of 436. The number of Bills of Sale published in England and Wales for the four weeks ending Saturday, November 27th, was 1,089. The number in the corresponding four weeks of last year was 1,055, showing an increase of 34, being a net increase, in 1886, to date, of 366. The number published in Ireland for the same four weeks was 62. The number in the corresponding four weeks of last year was 68, showing a decrease of 6, being a net increase, in 1886, to date, of 105.

### EMINENT TEXTILE MEN. No. 6.

#### John Brinton, Esquire, J.P.

John Brinton, Esquire, J.P., of Moor Hall, Stourport, and head of the firm of John Brinton and Co., Limited, carpet manufacturers, of Kidderminster, was born, in the latter town, in the year 1827. The firm are in the van of carpet producers, being well known in all parts of the globe where this fabric is in use. He was educated at Birmingham, and, on attaining his majority, entered the above firm of which he has been the leading spirit for many years. The father of the subject of the present sketch commenced business in the year 1821, on a rather small scale, and for more than 20 years did not extend operations to any great extent, until Mr. John Brinton and his brother joined him in the business. The carpet trade, at this time, was in a rather peculiar state, owing to the rapid strides that Messrs. Crossley and Sons, of Halifax, were making in the perfecting of machinery for weaving tapestry carpets, the consequence of which was that Kidderminster was in imminent danger of losing her trade. Messrs. Brinton and Co. were quick to perceive this, and spent large sums in the erection of suitable buildings and in fixing the latest stamp of machinery, and thus they laid the foundation of their future prosperity. About this time, the power loom for the weaving of Brussels carpets was introduced, and Messrs. Brinton and Co. were amongst the first to adopt it, as they saw that, in order to keep their position in the trade, this was an absolute necessity. It is not for us to give an account of the trouble which arose between masters and men from the introduction of the power loom; this is a matter of history well known to those interested in the carpet trade. But Messrs. Brinton and Co., with considerable tact, overcame all difficulties, and continued to add to their stock of machinery the newest appliances for the production of both Brussels and tapestry carpets. This, of course, necessitated the erection of extensive buildings, and at the present time they cover an area of six acres, and the production of carpets has continued to increase year by year, and in an artistic sense they rank with those of any other manufacturer either in this country or abroad. At the various exhibitions during the past 30 years, they have more than held their own, having, with one exception, taken the highest award. Through all those years, the subject of this sketch has been the leading spirit in the business, and, whilst attending to it, he has by no means neglected to fill a prominent position in public matters. In questions affecting the carpet trade, especially, he has been considered an authority, and has never been backward in giving much of his time, as well as advice, to his brother manufacturers, when questions of vital importance have arisen in connection with the industry. Mr. Brinton held the onerous position of Chairman of the Kidderminster Manufacturers' Association from its formation in 1864, until 1879, when he retired; he is Chairman of the School of Art, the duties of which office he has fulfilled for 21 years; he is also Chairman of the Board of Guardians, and was, for some years, Chairman of the School Board. He has been a magistrate for Kidderminster since 1856, and J.P. for the County of Worcester since 1876. In 1880, he, as a moderate Liberal, successfully contested Kidderminster, but the validity of his election, upon a technical point, being called in question, he resigned, and was elected unopposed shortly afterwards. As a speaker, he has made his mark in Parliament as a practical man, and has always given his opponents the idea of his thorough earnestness and conscientiousness in his opinions. In trade matters, his advent to the House of Commons was welcome, but unfortunately, in 1885, his health broke down, after his election for the third time, and at the urgent entreaties of his medical advisers, he was reluctantly compelled to withdraw (it is to be hoped only for a short time) from Parliamentary life. He has, recently, taken a seat as a Director of the London and Yorkshire Bank, and also, by request, as a Member of the Council of the African Royal Mail Steamship Company. Mr. Brinton, with his characteristic generosity, intends to commemorate Her Majesty's Jubilee year by the gift of a Public Park to his native town, Kidderminster.



## ORIGINAL ✕ DESIGNS.

On our first special plate, we present our readers with a life-like portrait of John Brinton, Esquire, J.P., carpet manufacturer of Kidderminster, and of Moor Hall, Stourport. Much interesting information regarding this gentleman will be found on page 65, under our heading of Eminent Textile Men.

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On our second page, we give a design for a Counterpane, which has been drawn by Mr. G. Lees, Commercial Buildings, Kidderminster.

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On our third page, is a design drawn for a Tapestry Fabric by Mr. R. T. Lord, 97, Park Road, Bradford.



## MONTHLY TRADE REPORT.

**Wool.**—During the early part of last month, trade was of a rather restricted character; spinners having satisfied their requirements, to a large extent, were not disposed to give the high rates asked by staplers, and, in consequence, values had a softening tendency, and the demand was of a dragging nature. As the month advanced, business assumed a more cheerful aspect, and buyers acted with less timidity, and sellers asked fractionally higher prices. At the latter end of the month, holders of wools held out for extreme rates on the assumption that, at the forthcoming London Sales, firm prices would be the rule, and they declined to sell unless full rates were paid. At the London Sales, which commenced at the beginning of this month, prices declined 5 to 10 per cent., according to description, up to the time this report was written. In the yarn and piece branches, there is little change to note, orders for the former, if numerous, have been small in quantity and for quick delivery. Prices have kept tolerably firm. Piece goods have been rather quieter, buyers generally offering lower rates for most descriptions, although manufacturers have been reluctant to make any concession in prices.

**Cotton.**—The yarn and piece trades, on the whole, have been of a fairly satisfactory character both as regards orders and prices. The export branch has shown signs of improvement; for India and China some fair sales of cloths especially adapted for those markets have been made at hardening rates. For the home trade, the better class of shirtings and print cloths have been in fair demand, and the tendency of prices has ruled slightly higher. The lower descriptions have been rather quieter and prices generally show a weakening aspect. More machinery, both for spinning and weaving, is being run, and strikes are fewer and smaller in dimension than for some time past. On the whole, the outlook for the future seems hopeful.

**Woollen.**—There is nothing new to report in any branch of this industry. Machinery generally is well employed. Perhaps orders are not quite so numerous as manufacturers expected a short time ago, but this is to be accounted for by the mildness of the season. In the heavy woollen district especially is the effect of the weather felt, and manufacturers are anxious in consequence. The fancy worsted trade still keeps fairly busy on cloths of different qualities, and those engaged in this industry are hopeful of a good trade for the next few months. The woollen branch has been fairly active, although the clothing trade, especially as regards overcoatings, has not come up to expectation, owing to the reasons given above. The export trade, in nearly all classes, is rather better than the home branch.

**Linen.**—The flax trade has shown but little variation during the month. Samples of new flax to hand are of better quality and condition than those of last year. The demand has been fairly steady, and the tendency of prices has ruled slightly higher. Linen has improved, and has shown more than an average business both for home and foreign account, with prices about as last month. Jute yarns and goods have had a steady demand, at firm rates, prices having advanced slightly.

**Lace.**—Perhaps this branch has shown a little more life during the month, as far as the demand is concerned, but prices generally have been unsatisfactory. The curtain trade has been fairly employed, and the lower qualities of cotton laces have had much notice. Nets, with the exception of bobbin nets, have been quiet, as have also silk goods, the demand being meagre. There is no new feature to note in the hosiery trade.

## French Trade in the East.

Great efforts are being made by the French authorities in Tonquin (says *The Economist*) to arouse French manufacturers in France to compete with the English and Germans in supplying textile goods to the natives. The Chamber of Commerce at Rheims is urged to prepare woollen goods, and that of Rouen to manufacture cotton materials specially for these markets, and a promise is given that, as soon as French manufacturers are ready to supply suitable goods, the general, or prohibitive, tariff would be applied. The Rouen manufacturers not being satisfied with this inducement, the Chamber of Commerce has passed a resolution declaring "that, while they appreciated the excellent intentions of the French Resident, they could not recommend manufacturers to produce articles for the exclusive use of the natives, until a protective tariff had been established, so as to secure the market to them." The Chamber, therefore, demands that the general tariffs may be applied, immediately after which manufacturers may give themselves, in full confidence, to the production and export of the goods consumed by the natives." The Director of the Commercial Museum at Saigon has invited French manufacturers to send out patterns, models, and samples, accompanied by prices, promising them, as inducements, gratuitous insertions of their advertisements in *The Moniteur de la Cochinchine Française*, in French, and also in *The Gia Dinh Bas*, published in the Annamite language, as well as the distribution of bills, printed in the Chinese language, to the Chinese merchants of Saigon, Chalong, and of the interior. "But," says *The Economist*, "This official assistance will be of little avail to create a market for French goods, unless manufacturers display more enterprise than those of Rouen." The French authorities in Cochin China have decided that, from January 1st, 1887, the Administration will employ, exclusively, French productions, and the Director of the Museum urges upon merchants to desist from sending out articles not in fashion, and clearing off lots, as they have been in the habit of doing for the past two years—as they are useless to the natives, and European residents are well informed as to what is fashionable at home. Some of the French manufacturers and merchants are alive to the necessity of using their utmost endeavours to push their trade in the East. The Chamber of Commerce of Elbeuf, or rather the Committee of Manufacturers and Merchants formed under its patronage, and that of M. Dautresme, a former Minister of Commerce for France, has carried out its intention to send a commercial agent to Tonquin, China, and Japan, to open up new markets for the produce of Elbeuf industry. M. Daniel Wehrin, of Mulhouse, a student of the High Commercial School, who has already spent a year in Cochin China, and who has presented a report upon the trade prospects of that region to the Society for the Encouragement of French Commerce and Exportation, has been selected for the mission. He left Toulon some weeks ago for Tonquin. His arrival will coincide with the opening of an Exhibition in Hanoi, and he is to utilise the opportunities afforded to introduce to the dealers the light woollen piece goods of Elbeuf. On the termination of this Exhibition, he is to visit Hong Kong, Canton, Shanghai, Chin-Kiang, Hankow, Ichang, Tientsin, and Yokohama, Hiogo, Nagasaki, and Hakodate. It is urged that if other French manufacturing centres would follow the example thus set by Elbeuf, "the French export trade would quickly regain the importance it has lost."



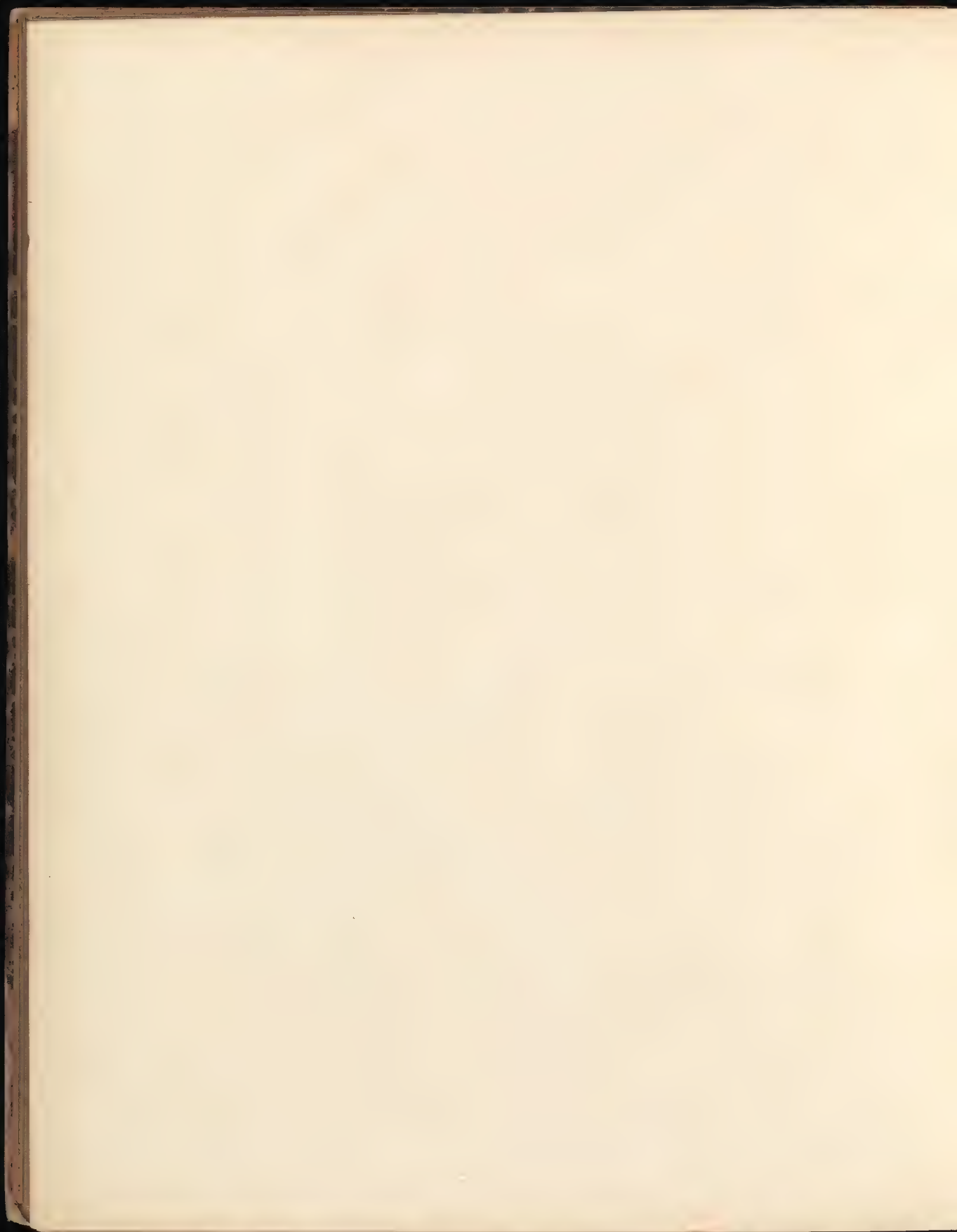
December 12th, 1886.

THE JOURNAL OF FABRICS AND TEXTILE INDUSTRIES.



EMINENT TEXTILE MEN.

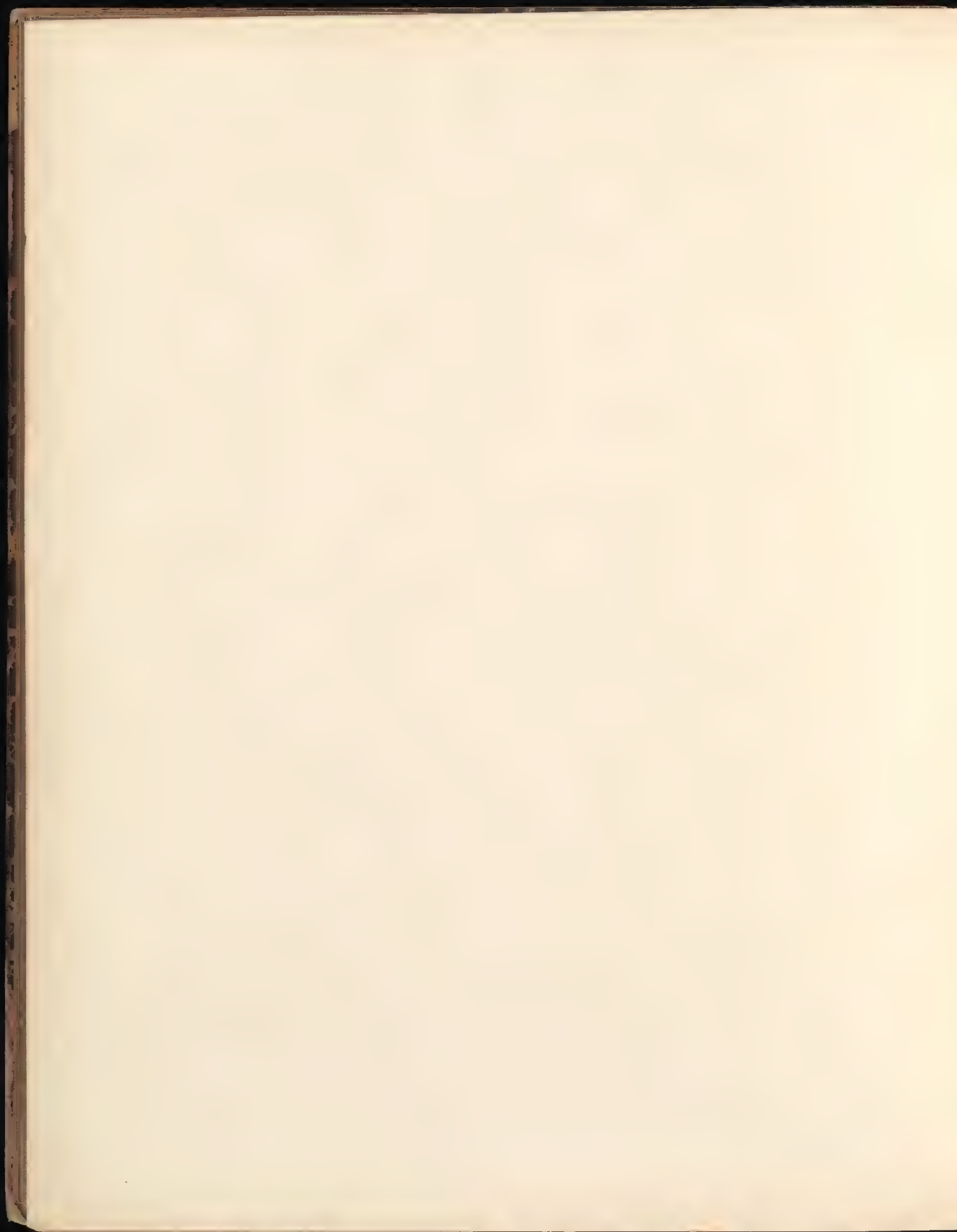
No. 6.—JOHN BRINTON, Esq., J.P.







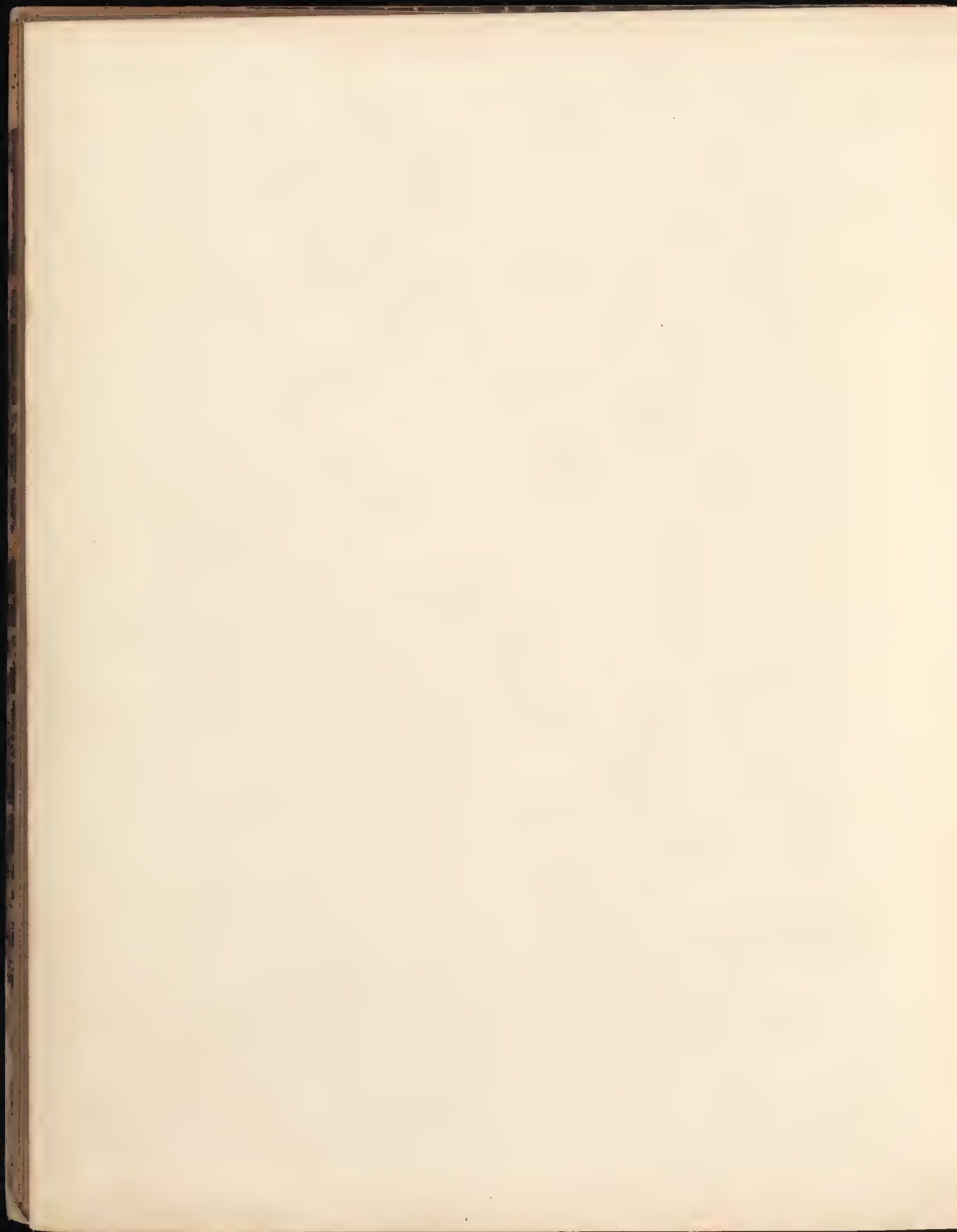
COUNTÉIRNE.







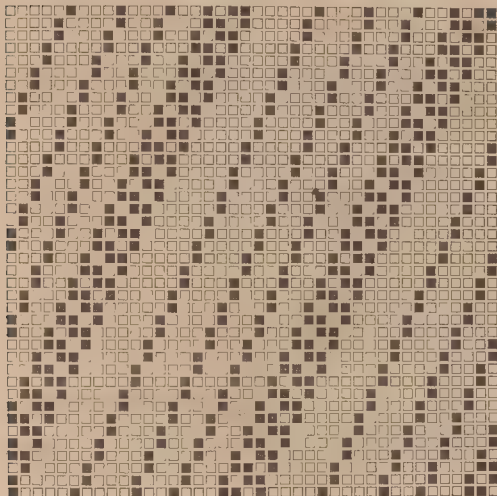
TAPESTRY FABRIC.





**Diagonal Worsted Coating.**

No. 416.



Design.

80 ends per inch. Woven in 20 shafts dobby.  
 80 picks per inch. Drawn straight gate over.  
 2/48's warp and weft. One colour.

**Worsted Trousering.**

No. 417. Warp:—

24 Black, 2/20's. 6 healds.  
 1 Blue, " 52 ends per inch.  
 4 Maroon, " 50 picks "  
 1 Blue, " 4 ends in a reed.  
 19's reed.  
 64 inches wide in the loom.  
 56 " " when finished.



Woven  
 all Black 2/28.

Draft.

All 2/20's worsted.

Finish clear and smart.

Weight 23 to 24 ozs.

**Woollen Trousering.**

No. 418.

Warp:—

10 ends Black self twist, 2/28 skeins woollen.  
 1 end White silk twisted to Crimson woollen, 28 skeins.  
 1 " White woollen, 28 skeins twisted to Black woollen, 28 skeins.  
 1 " Black and Orange twist, twisted to Black woollen, 28 skeins.  
 1 " Brown self twist, 2/28 skeins woollen.  
 1 " Black and Orange twist, twisted to Black woollen, 28 skeins.  
 1 " Brown self twist, 2/28 skeins woollen.  
 1 " Black and Orange twist, twisted to Black woollen, 28 skeins.  
 1 " Brown self twist, 2/28 skeins woollen.  
 1 " White silk twisted to Crimson woollen, 28 skeins.  
 1 " White woollen, 28 skeins twisted to Black woollen, 28 skeins.

Woven all Dark Blue self twist, 2/28 skeins woollen.

2,640 ends.

40 ends per inch.

40 picks "

8 healds

4 ends in a reed.

10's slay.

66 inches wide in the loom.

56 " " wide when finished.

Straight Draft.

Finish soft and mellow.

Clear and smart.

Weight 24 ozs.

**Woollen Suiting or Ulster Cloth.**

No. 419.

Warp:—

12 ends Claret, 17 skeins woollen.  
 2 " White  
 4 " White, 36 skeins, twisted to Canary  
 36 skeins, at 20 runs per inch.  
 2 " White, 17 skeins.  
 2 " Scarlet "  
 10 " Claret "  
 2 " White "  
 4 " White, 36 skeins, twisted to Canary  
 36 skeins, at 20 runs per inch.

Woven:—12 picks Claret, 17 skeins woollen.

2 " Drab " "

4 " Light Olive " "

2 " Drab " "

3,564 ends.

54 ends per inch.

52 picks "

3 ends in a reed.

18's slay.

66 inches wide in the loom.

56 " " when finished.

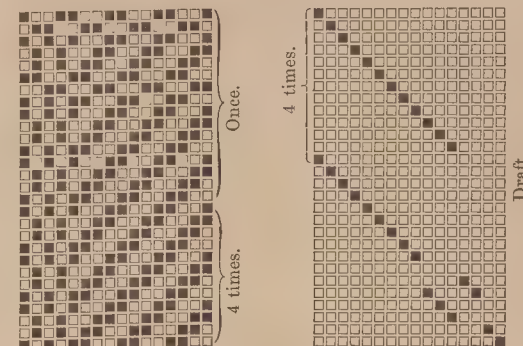
Straight Draft.

Finish soft and mellow.

Weight 24 ozs.

**Woollen and Worsted Suiting.**

No. 420.



Design.

Warp:—

9 ends Black self twist, 2/20 skeins woollen.  
 1 end White  
 1 " Black, 40 skeins twisted to White, 40 skeins, 12 runs per inch.  
 1 " White self twist, 2/20 skeins woollen.  
 9 ends Black  
 2 " Stained worsted, 2/48's, or 13,440 yards to the lb.  
 1 end White self twist, 2/20 skeins woollen.  
 1 " Black, 40 skeins twisted to White, 40 skeins, 12 runs per inch.  
 1 " White self twist, 2/20 skeins woollen.  
 2 ends Stained worsted, 2/48's, or 13,440 yards to the lb.

30 ends per inch } worsted additional.

30 picks " }

3 ends in a reed.

10's slay.

66 inches wide in the loom.

56 inches wide when finished.

Woven as warped.

Finish soft and mellow.

Weight 24 ozs.

## MACHINERY & TOOLS, & C.

### "Lemaire's" Patented Feeder for Wool and Worsted Cards.

Maker:—Mr. Samuel Brooks, West Gorton, Manchester.

Numerous inventions have been patented during the past few years for the feeding of wool and other textile fibres into breaker cards, pickers, wool washing machines and such like mechanisms. These have been more or less successful, and each invention has possessed merits of its own, which have given it advantages over its predecessors. Lemaire's Automatic Feeder, now being made in this country by Mr. S. Brooks, Union Iron Works, West Gorton, Manchester, has many points, which place it in the front rank of feeders, and, in several respects, it far outstrips any apparatus before invented. It is largely used on the Continent and in America, having gained a firm footing in a great number of factories. In this country, its merits have only recently become known, but, notwithstanding this, a fair number have already been placed in some of our largest mills, and inquiries for it are becoming exceedingly numerous. The advantages of automatic, over hand, feeding are too well known now for it to be needful for us to particularize them to our readers. In feeding by hand, it was, and is, necessary to weigh a certain quantity of fibre before placing it upon the feed apron, therefore, most inventors started with the idea that this process of weighing by hand should be replaced by an automatic weighing apparatus, which should be applied to their respective feeders. Three defects are noticeable in all feeders belonging to that class of machines, and these defects are impossible to be overcome. Allowing that a certain correct weight of stock is carried to the scale box, it is impossible to distribute this stock evenly upon the feed apron. For instance, if, on one side of the feeder, the material runs thicker to the weighing box than on the other, or even very close to it, this surplus on the one side, which means in the weighing scale a diminished quantity on another place, will drop on the corresponding place on the feed apron, though the whole quantity of stock, which at one time is discharged from the weighing apparatus, might be exactly correct. Owing to the evaporation of more or less of the water contained in the oil by which the stock is made flexible, it is rendered impossible always to have the desired quantity of actual stock fed. Suppose a lot of 1,000 pounds of wool is oiled to-day for a certain set of cards, and about 300 pounds are carded the first day after the scale has been set to that weight; it is evident that, especially in summer time, a part of the water, if not all, will have evaporated by the next day, and the scale will make up for that loss in feeding more actual stock. In such cases, the automatic weighing apparatus is useless. It is utterly impossible to weigh an exact amount of long combing or carpet wool, since only about  $\frac{3}{4}$  to  $1\frac{1}{4}$  lbs. are to be delivered to, and discharged from, the scale. The fibres would have to be cut in two to make up just this light weight at one time. In order to overcome these defects, a system has been invented in which no weighing box is applied, but where an actual quantity of stock is fed from the stock box by means of combs or regulators to the feed apron. To this class belongs the Lemaire feeder, which covers all the objections hitherto mentioned, and brings about the desired result without any scale. Fig. 1 represents a Lemaire Feeder for wool cards, pickers, and wool washing machines. It contains a cylinder of about ten inches in diameter,

which, lying at the bottom of the stock box, and being covered with sharp steel hooks, envelops itself with the stock as it revolves. On the top of the cylinder is a regulator composed of a toothed blade. This regulator has a combing motion, and it works into the hooks of the cylinder, allowing only an ascertained quantity of stock to pass through its teeth. The comb takes the stock from the cylinder, and lays it on the feed apron. This feed apron travels only one-third or one-fourth of the distance travelled by the cylinder. In this proportion of movement is found one of the essential peculiarities of the machine, namely, that by which the greatest evenness of feeding is obtained. For example, while this feed apron advances, say six inches, the cylinder has travelled a distance of about twenty-four inches, and the comb, which clears the cylinder and delivers the stock to the feed apron, has worked forty-eight times. If we consider the proportionate distances travelled by the apron and the cylinder, it will appear that the stock fed on the feeding apron must have been made by doubling four times the stock which passed through the regulator at one time, and thus a most exact evenness may be attained. Fig. 2 shows a Lemaire Feeder

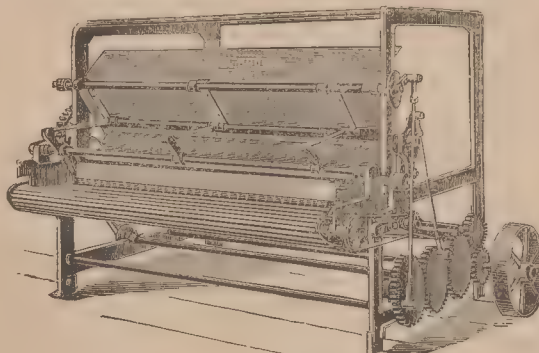


Fig. 1.—Lemaire's Woollen Card Feeder.

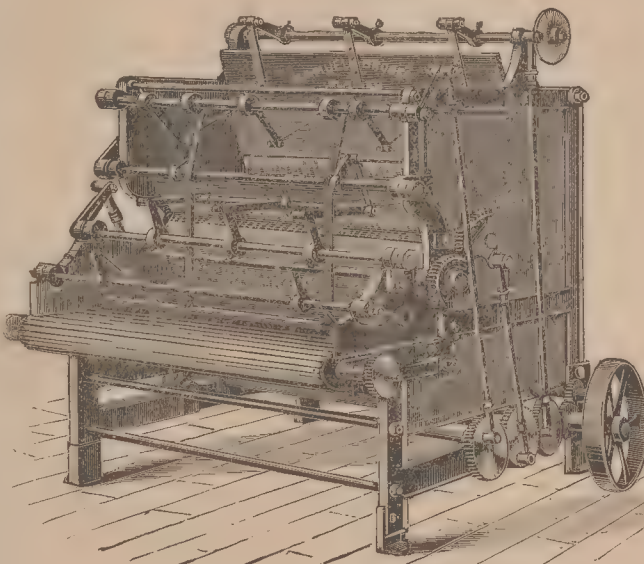


Fig. 2.—Lemaire's Worsted Card Feeder.

made especially for use in worsted yarn spinning mills. This so-called Worsted Feeder works upon the same principle as the Wool Feeder. The main difference between the two machines is that the effect of the combing regulator in the former is increased by an additional regulator and by an intermittent motion of the cylinder, it being the great aim in all the processes required in making worsted yarn to have the fibres of the stock laid and combed out lengthwise to each other as much as possible. Fig. 3 gives a sectional view of the mechanism. The frame of the machine, with the swinging board A', really constitutes a stock box, of which the lattice apron A composes the bottom. The material being fed into this box falls upon A and is carried by it to the cylinder B. As, when the wool supplied to the box approaches exhaustion, the feed apron A might not carry a full supply forward to the cylinder B, and thus fail to do its duty, the backboard A' has been suspended upon hinges, and is made to swing forward in the direction of the cylinder, thereby greatly assisting to keep the latter supplied with material as long as it is necessary. As the cylinder B gathers up all the wool in its revolution, it carries it forward within range of the first regulator C, which combs off the superfluous wool from the cylinder, and at the same time straightens the fibres effectually. The second regulator D assists to perfect the work, the result being, by the combined action, an even layer of wool. This is next removed from the cylinder B by an oscillating comb or doffer, E, and deposited on the board F, which, being supplied with hook teeth, retains it. It is removed from the board F by the radial sweep of the padding board, G, which, being furnished with a strip of leather in front, takes the material from the boards and pads, and presses it upon the card apron H, whence it passes out of the mechanism to any further process that may be required in its manufacture. Many advantages are claimed for the feeder, amongst which are the following, viz.:—There is absolutely no rolling of stock; the opening and preparing work is done most effectively, with a consequent superiority in carding, and there is less waste made; even feeding is ensured over the whole width of the apron, no matter what kind of fibre is used; it is simple in construction, and, therefore, less liable to get out of order, there being no complicated mechanism or delicate weighing apparatus; it is easily and quickly cleaned; it opens, combs, and stretches the longest worsted stock, and lays, to a great extent, the fibres lengthwise and parallel to each other. The feeder can be seen in operation by applying to Mr. S. Brooks, who will also furnish fuller particulars of its capabilities.



### Cooke's Lubricating Boiler Compound.

From time to time, improvements continue to be made in nearly all descriptions of boiler cleansers, and one has been brought before us which should be of interest to a large section of our readers. After considerable research and experimenting, Mr. J. Cooke, of Folly Hall, Huddersfield, has compounded a liquid preparation of a purely vegetable nature, and one that is guaranteed free from any constituent that would have an injurious effect upon boiler plates. It will speedily remove, and prevent the formation of any foreign deposit or incrustation, and will also provide against corrosion of the plates. Of course, there are numbers of compounds for this purpose in the market, all acting with more or less success, and it is for users to give this commodity a trial, and judge of its capabilities from practical experience. A special feature of the liquid is its valuable lubricative properties, as it penetrates the steam to the cylinders and other parts, and consequently reduces the quantity of lubricants required for the cylinders. In fact, it is guaranteed that a saving of 50 per cent. will be effected in this respect. The price is one advantage in its favour, and, combined with its effectiveness, ought to ensure it a ready sale. We may add that a patent has been taken out for the preparation, and Mr. Cooke will give every facility for testing its fitness for the work it has to perform.

prepared glass, both contents and working can be seen at a glance. In this cup, there is no condensed water whatever to contend with. The exceedingly low price at which they are offered, the little expense required to keep them in repair, and the number now in use, should induce every user of steam engines to have them applied—in fact, no engine should work without them; the cost of application is quickly gained, as the quantity of tallow, or lubricant, required to effectually lubricate an engine cylinder with these lubricators, is less than with any other; it may also be seen how the oil passes into the cylinder. The lubrication is constant, therefore the friction in the cylinder is reduced to a minimum; hence a saving in fuel, wear and tear, and more steady turning result. The system of giving tallow or oil to a cylinder, by the old lubricator, can only be reckoned by rule of thumb, it may be a little more or a little less, but in no case regular, and is done by giving, at intervals, a flush of the lubricant. With these lubricators, however, it is easily seen what is going into the cylinder, the oil passing in drop by drop, or faster when required. If more be given than is required, which should be avoided, after a few strokes of the piston, the overplus is blown away with the exhaust steam. The crank lubricator (Fig. 2) is made for the purpose of lubricating cranks or bearings. The top does not require removing when charging, and, having a glass tube underneath, the engineer is enabled to see at once the amount of oil being used.

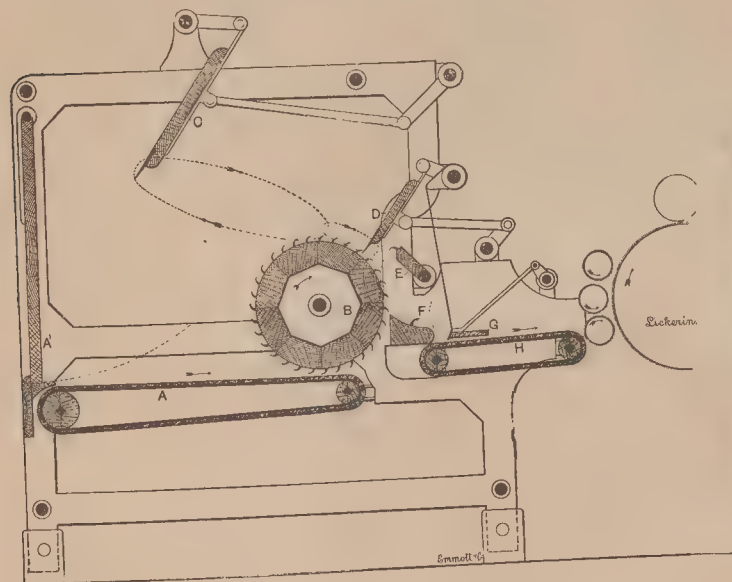


FIG 3.—Lemaire's Worsted Card Feeder.

### Hailwood's Patent Lubricators.

A few days ago, a test of the capabilities of Hailwood's Patent Lubricators was made upon a pair of horizontal tandem condensing steam engines of 1000 horse power, that have been erected for the Arkwright Spinning Company, Rochdale, by a firm of engineers in that town. On a previous occasion, we gave full particulars of these lubricators, since which, numbers of them have been fixed to engines, and have done their work in a very satisfactory manner. On the occasion above referred to, the engines were started for the first time by a public ceremony, and the lubricators, eight in number, having been placed upon the engines without any previous test, fulfilled all that was required of them in so admirable a manner that they gave general satisfaction. These lubricators, which were recently patented by Mr. J. T. Hailwood, of Ramsey Street, Rochdale, who is the sole manufacturer of them, contain many noteworthy improvements. We illustrate two of them, from which our readers will be able to draw comparisons between them and any lubricators they now have at work, and we may add that the saving effected by them, in every respect, is worthy the consideration of users. The high-pressure lubricator (Fig. 1) can be easily regulated to run fast or slow, and can be fixed on steam pipes, valve-easily regulated to run fast or slow, and can be fixed on steam pipes, valve-easily regulated to run fast or slow, and can be fixed on steam pipes, valve-easily regulated to run fast or slow, and can be fixed on steam pipes, valve-

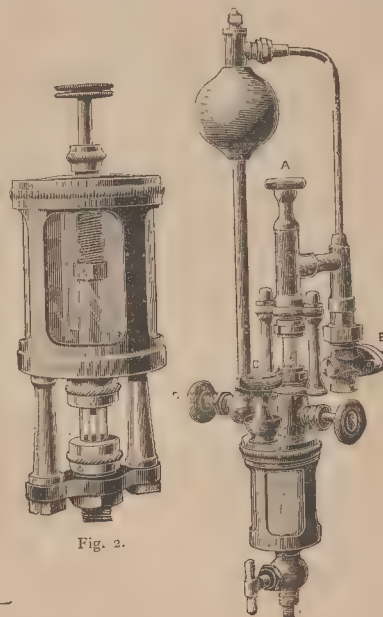


Fig. 2.

Fig. 1.

Having a valve at the top to regulate the drop, any class of oil can be worked. It also dispenses with the wires usual in these lubricators, and ceases to work when the engine stops, hence a very great saving in oil. Mr. Hailwood, being sanguine of their superior qualities, will give every reasonable facility for testing the capabilities of the lubricator.

### Allen's Patent Gumming Machine.

A very ingenious, simple, and useful machine, for "gumming" purposes, is now being put upon the market by the Allen Machine Company of Halifax, Yorkshire. Various contrivances have, from time to time, been brought out for superseding the ordinary "gum or paste pot," but none, we venture to assert, are in any sense to be compared with the above machine, either for utility, rapidity and cleanliness, or for durability. We have one of these machines in constant operation, which we have had the pleasure of showing to scores of tradesmen, who, without exception, pronounce it a most perfect piece of mechanism, and predict for it an enormous sale. In a great variety of businesses, and especially in the different branches of the textile trades, gummed labels of different kinds are largely used, and this apparatus is, therefore, of special interest to the heads of such houses, and in order to be thoroughly appreciated, its utility in practical work, and the economy it will effect, in the many purposes to which it is adapted, should be tested, when, undoubtedly, it will prove satisfactory in every respect. The machine occupies but little space; it is 8½ ins. long, 4½ ins. broad, 4½ ins. high, and weighs 7½ lbs. The Company guarantee a saving of from 50 to 75 per cent. in gum, labels, and labour, and also state that those who have an average quantity of gumming to do, can recoup themselves for the outlay of the machine in a few weeks. The cost of the machine is 30s. From the

annexed illustrations, a good idea can be had of the apparatus. Fig. 1 shows the position of a label having its entire surface gummed, and Fig. 2 shows the position of an invoice, wrapper, &c., when having its edge only gummed. In conjunction with the machine, the Allen Company are manufacturing "Gumolene," specially prepared to be used in their apparatus. This they guarantee free from both sediment and injurious chemicals, of extra strength, and at prices 25 per cent. lower than those of ordinary gums. Our readers interested cannot do better than order machines of the Company, as they entirely do away with the objectional licking of labels, which are too often gummed with substances nauseous and deleterious in a high degree. They also entirely obviate the necessity of keeping gummed labels in stock, which often, through damp and other drawbacks, become useless. The apparatus has been patented in France, Germany, Austria, Belgium, British Colonies, and the United States, and patents in many other foreign countries are being proceeded with. The company has just been formed; the first issue of capital being fixed at £30,000, and shareholders are now being asked for. Full particulars can be had, and prospectuses forwarded to any address, on application to H. and R. T. Lord, 10, Ann Place, Bradford.

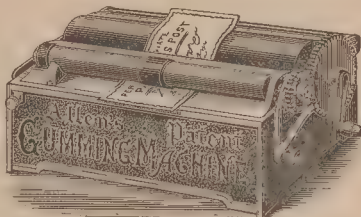


Fig. 1.



Fig. 2.

### The Utilisation of Waste Grease from Wool.

#### A NEW METHOD OF MAKING A CHEAP AND USEFUL SOAP.

Every one connected with the woollen trade is aware of the efforts that have, from time to time, been made to put to profitable use the waste products obtained from wool when it is being cleansed. The cleansing of wool is a costly and tedious operation, requiring the exercise of considerable care and skill. More than half the waste removed from the wool in the process of purification consists of grease and nitrogen. These products have frequently attracted the attention of chemists. Much wool contains far more grease than do many seeds and grains from which oily extracts are obtained. If this could be made into soap, or into a compound that could be used for washing wool, the nitrogen, and some other constituents of the remainder of the waste, could be very profitably and advantageously disposed of for use as agricultural manure. The attempt to make soap of this grease never seems to have been thoroughly successful. The article produced lacked purity, and gave off a disagreeable animal smell, which could be got rid of by exposure to air and water; but then, if the soap were used to cleanse wool and tissues, it stained or otherwise injuriously affected them. In many cases, the difficulty of dealing profitably with the grease has proved to be so great, that it is allowed to pass away with the refuse water into adjoining streams. The manufacture of potash from it has been carried on with more or less success, in many parts; but, owing to the discovery of potash deposits in Germany, its manufacture from wool grease is now frequently unremunerative. This subject is one which has attracted much attention in France, and efforts have continually been made to utilise the waste for soap making. At Ellbeuf, a manufactory was established for the purpose, but it was recently given up as a failure. At Roubaix, some of the wool carders extract potash from the grease, and then utilise the remainder for a soap for their own use. Much trouble has been caused by the nuisance which has arisen from turning the greasy waste products into the rivers. At Rheims, La Veste, and other places, where the fall of the bed of the river is slight, and the flow sluggish, the grease has deposited in such large quantities that an oar may be pushed down into it to the level of the water, and it will stand perpendicular. In warm weather, unhealthy and offensive gasses rise in large quantities, and poison the atmosphere of the whole neighbourhood. At Roubaix and Tourcoing, the deposits in the Es pierre, which has its outlet in Belgium, have given rise to such serious and persistent complaints from the inhabitants of the district that the Belgian Government

have threatened to dam the river up unless steps be taken to remove the nuisance. Recently, M. Rohart read a valuable paper before the French National Agricultural Society, in which he claimed to have discovered a method by which this wool grease can easily and cheaply be made into a soap that will be specially valuable for many purposes. When the grease is brought to its point of fusion, he finds that it will absorb certain mixtures of sulphur very readily, and to such an extent as to retain in a fixed state one hundred times its volume of sulphuretted hydrogen. After this operation, the sulphur having become an integral part of the substance, it develops new properties which can be treated entirely differently from what the original grease could, and new results can be obtained. The grease becomes immediately and altogether soapy in a cold state. M. Rohart showed a piece of soap, as a sample of what is being regularly made and sold by Messrs. Michaud Brothers, of Aubervilliers. It possessed no odour of the original grease, nor of sulphuretted hydrogen. There is a very close combination between the principal constituents of the material. The mixture is fine, and of perfect homogeneity. The article is not a toilet soap, and its origin indicates that it would not be very suitable for the skin; but it is a cheap soap, and if what is said of it be true, should be very useful and economical for many purposes. M. Rohart says that the operation of making it is completed in less than an hour, while the ordinary preparation of soap, based on soda, takes several days. If there were placed, one above another, two troughs charged with this mixture, a continual manufacture of 50 tons of soap per day could be readily carried on, without appreciable expense for fuel and manual labour. M. Rohart claims that this chemical action is new, unexpected, and of considerable interest; and that, contrary to previous knowledge and experience, soap may now be completely made from fatty substances of all kinds, not with caustic alkalies, but with carbonated alkalies. This he states to be a new scientific fact, not confined to such fats as were formerly transformed to acid fats, but a general result, applicable to all substances of a soapy nature. That which is claimed to be new and certain is that in the presence of fatty substances, first suitably sulphuretted, the solutions of alkaline carbonates are immediately decomposed in a cold state. The carbonic acid liberates itself so abundantly that the mass rises and bursts out and overflows, if the receptacle used be not deep enough. It is a case of atomical change, a simple phenomenon of substitution, which reveals the force of the affinity of the alkalies for the sulphur. The carbonic acid is expelled from the combinations which it forms with the potash or the soda. The reduction of the cost of manufacture, especially in the matter of soda, is claimed to be considerable. M. Rohart points out several ways in which this soap, with a large quantity of fixed sulphur in its composition, will be valuable. For the destruction of insects and parasites of all sorts on vines, vegetables, and agricultural crops of various kinds, he considers that this soap may be more easily, pleasantly, and efficiently used, than any of the powders, solutions, and vapours, at present employed. For the purification of infected linen, bedding, and clothing, it is cheap, effective, and convenient, and has proved extremely satisfactory in the experiments that have been made with it in public lavatories and wash-houses, as well as in private households. M. Rohart says that all his statements are based on actual experiment and fact, and not merely on theory.

### Improved Trade and the Necessity for Technical Training.

Mr. Henry Mitchell, in a speech recently made in Bradford on the occasion of the presentation of a clock by Lady Beehive to the "Power Loom Overlookers' Friendly Society," stated that there was a marked improvement in the trade of Bradford, and that this amendment had also been experienced in the country generally. Strong proofs of this were seen in the slightly improved revenue, and still more in the large increase of traffic on the principal lines of railway. He had just come into possession of a return which showed an advance on twelve out of the fifteen principal lines, the increase during the past week amounting altogether to over £20,000. There was another evidence of improvement, and one with which all who heard him might not be quite so familiar. He referred to the amount of money which every week passed through the Clearing House in London—an institution where most of the cheques and bills drawn in this country had to be dealt with. During the last week, the return from the Clearing House was £159,000,000, against £138,000,000 in the corresponding week of last year. There was yet another reference he might make on this question, and that was to the increased deposits in the savings banks. Referring particularly to Bradford and district, he thought the improvement in trade was more decided there than in any other part of the country; for, although there had been a great decline in some branches, yet that deficiency had been almost entirely made up by the introduction of new industries, and the total figures of their trade amounted to almost as large a sum as ever, although prices were very much lower. After speaking of the values of various manufactured goods exported to the United States, and showing his hearers that this prosperity was due, to a large extent, to the increased variety and excellence of their productions, he stated that there was still another question to which he deemed it his



duty to call public attention—that was the necessity for the systematic training, scientific and technical, of young people who were to take responsible positions in connection with their various industries. No doubt, some of them thought that they might, in an institution, train a number of superficial overlookers, who had a sort of theoretical knowledge of their work, but had little practical acquaintance with it. Overlookers could only be thoroughly trained in mills and workshops, and must go through many years of close attention and hard work. He had a notion—they, perhaps, might not all agree with it—that nature did not provide more thoroughly competent men to fill responsible positions than there were responsible positions to fill. It seemed very difficult, for instance—indeed almost impossible—to find a suitable man to occupy the throne of Bulgaria, and he did not think there were half a dozen men in this country competent to fill the position of Prime Minister. So it was with many other important and responsible positions. There did not, as a general rule, seem to be more thoroughly competent men than there were posts to be filled. Of course, there were many men who thought they were competent, but that was another question. It was not what people thought, but what they were capable of doing. Although he did entertain these views, however, he did not contend that an education, such as could be given in their technical college, did not confer many advantages, and might not be the means of solving many difficulties. They, as overlookers, must bear in mind, also, that they had charge only of one department, and that it was of the utmost importance that all the different processes in manufacturing operations should be carried on by men who were thoroughly competent, and who understood the best methods of working. In the case of fancy and high-class goods, generally, the overlookers had simply to carry out the designs and instructions placed in their hands, and, if these designs were unsuitable, or the combinations of colour were not in good taste, or properly arranged, however well they might do their part of the work, the result was not what the public wanted, or what they would pay a price for. Therefore, it was of the highest importance to have thoroughly competent men in all departments of manufacturing. There was no doubt that a while ago France and Germany had, to some extent, a considerable monopoly of the manufacture of the higher classes of goods to which he had referred, because they had for years devoted special attention to the training of their designers, and those who had to get up the combinations of colour in their goods. He believed, however, that England would not long be behind in the race. They were holding a very strong position indeed in their staple industries. With regard to articles for men's wear, which were not so much liable to changes of fashion, they had, to a large extent, a practical monopoly, and he felt sure that, with proper attention to the matters he had indicated, they would have a full share of the trade of the world even in that class of articles which had been so largely made in other countries. He was glad to find that there was in that town, especially, a disposition on the part of the operative classes to co-operate heartily with their employers in successfully carrying on the work. This was a most important matter. The operatives were as much interested as the manufacturers could possibly be in a successful trade, for on that depended their livelihood, and if they failed, they would be as great sufferers as any other classes of the people.

### The Statistical Society.

In a paper read before the Statistical Society by Mr. J. S. Jeans, who, in the field of statistics, is almost as well known as Professor Levi, he gave, perhaps, without intending it, some excellent reasons why the manufacturing districts should adopt some cheaper mode of transit than was furnished by railways. It appears that the average cost of railways per mile in England and Wales is £49,257, which is the highest in the world. In Finland, a country situated to the north of Sweden, the cost is least, being £5,430. The average for the world—excluding England and Wales—was £16,800, or less than one-third of what our lines cost us. The finding of interest on this immense cost entails a heavy charge upon the industrial enterprises of this country, which is still further aggravated by the manner in which the railway tolls are levied. It is sometimes said, not without some truth, that Lancashire and its immediate neighbourhood find the profits for most of the great railway companies in the land. As an example of the way we are handicapped, we find that goods are brought from New York to Liverpool for less money than they can be taken to the same town from Ormskirk, a dozen miles away. This, of course, is bound to affect the home produce, but, to make matters worse, the companies take imported goods to inland towns for less money than they will take English manufactured goods the same distance. The railway companies say they do this to encourage foreigners to send their goods to Lancashire ports in preference to other places. This may be all very well for Liverpool, and Fleetwood, and Barrow, but what about the agricultural and manufacturing industries of the country? If it pays the companies to carry a ton of goods to an inland town for five shillings, why should the home produce be charged ten? If the five shillings does not pay them then the home produce has to pay extra for the loss entailed by carrying the foreign produce or manufactured goods, as the case may be. In other words, the railway companies tax us for our competitors' benefit. This pernicious system can only be stopped by introducing an element of competition. As we

have seen, the great initial cost of railways, combined with the subsequent heavy charges for maintenance, precludes us from hoping to materially reduce prices by opening new lines. To do this we shall have to develop the canal system of the country, and, where necessary, make them sufficiently large to accommodate steamers. The proposal to construct a ship canal to Manchester is in the right direction. The gentlemen who were asked to form themselves into a consultative committee to ascertain whether or no such a canal could be made to pay, have now almost completed their labours, and there can be little doubt as to what their report will be. If it should be constructed, and it will be a disgrace to Lancashire if it is not, there is no reason why it should not afterwards be further extended. One of the London papers some time ago gravely suggested that it might even be cut through to London; but, without committing ourselves to this idea, it is certain that when once the advantages of a ship canal were practically seen, it would not be allowed to terminate at Manchester. We should not be surprised to find a demand for its extension to other large towns and centres of industry. Whether this will come to pass in the immediate future or not will depend on the capitalists of the county; but of one thing we are certain, and that is, that sooner or later it must come, and the sooner the better.—*Cotton Factory Times*.

### ODDS AND ENDS.

In consequence of the increasing number of parcels posted for Austria, Hungary, Belgium, Denmark, Germany, Heligoland, and Switzerland, a second daily parcel mail will be despatched to Belgium, Germany, and the other countries named, from London, *via* Ostend, on the morning of every week-day. There will be corresponding additional parcel mails from the countries in question to the United Kingdom.

The Royal Dublin Society—an old-established institution, which has for its aim the developing of Irish industries at home, and making them known on this side St. George's Channel, has decided to have an annexe, in the Manchester Exhibition, which shall be thoroughly representative of home productions. The committee is endeavouring to raise funds in order that space may be provided for exhibitors free of charge.

A Treasury warrant is issued, on the representation of the Post master-General, establishing the parcels post system between the United Kingdom and Tasmania and Western Australia, the rates of postage being two shillings for every parcel not exceeding two pounds, and for every parcel exceeding two and not exceeding eleven pounds, two shillings for the first two pounds, and ninepence for each additional pound to Tasmania, and one shilling for each additional pound to Western Australia. The warrant comes into effect on January 1st, 1887.

The Executive of the Northern Counties' Amalgamated Associations of Weavers—representing nearly 130,000 persons employed in weaving or the dependent branches—have forwarded to the Royal Commissioners on Trade a long statement of their views on the existing depression. They ascribe the want of employment and general falling-off in trade to several causes, chief among which are adulteration by over-sizing, marking short length (thereby deceiving retail dealers and consumers), foreign protective tariffs, and increase of production without a corresponding increase of consumption.

I learn, says a London correspondent, that serious steps are at last being taken, with English help, to test the possibility of navigating with steamers the upper waters of Yang-tze-Kiang. The river is easily navigable for about 800 miles, to Ichang. Beyond this come the rapids, and 400 miles higher up the great mart for the trade of Yunnan and Szechuen, Chung King. Two British firms have now joined together to survey the river beyond Ichang. An experienced navigator and a hydrographer have left Shanghai for the purpose, and in a short time we may expect at last to know the truth about the navigability of the higher waters of a river which drains the very heart of eastern Asia.

It is said that, with reference to the false stamping of goods, the following memorial, signed by, or on behalf of, about seventy firms, has been forwarded to the Chambers of Commerce of Calcutta, Madras, Bombay, and Kurrachee:—"The recent discussion respecting marking goods for India in a way that is calculated to deceive buyers as to the true lengths of pieces has convinced us that, whatever measures are adopted in England, no satisfactory and permanent remedy can be devised to suppress this evil other than the enactment in India of a statute making the offence penal, whether it is committed upon goods imported into, or manufactured in, India. We, the undersigned members of the Manchester Chamber of Commerce and others, respectfully suggest that your Chamber, and the mercantile community of your city, should direct the attention of the Legislative Council of the Government of India to the evil, with the view of obtaining a legislative Act similar to Act of 25 and 26 Vic., cap. 88, sec. 7, 8, 13, being 'An Act to Amend the Law Relating to the Fraudulent Markings of Merchandise,' which protects trade in this country."



### Receiving Orders.

Bilbrough, J., and Crowther, E. (trading as Bilbrough and Crowther), the Steander Mills, Mill Street, Leeds, Yorkshire, woollen manufacturers and merchants, Leeds Court.  
O'Leary, D. J., 26, Carter Lane, London, silk merchants.

### Adjudications of Bankruptcy.

Bilbrough, J., and Crowther, E. (trading as Bilbrough and Crowther), the Steander Mills, Mill Street, Leeds, Yorkshire, woollen manufacturers and merchants.  
Draper, F., Truman's Factory, Middleton Street, Nottingham, lately trading at Austin's Factory, Long Eaton, Derbyshire, lace manufacturer.  
Jackson, Sarah Ann (trading as J. Jackson and Co.), 34, High Pavement, Nottingham, lace manufacturer.  
O'Leary, D. J., 26, Carter Lane, London, silk merchant.  
Summers, W., and Summers, E. (trading as W. and E. Summers), Sion Hill Works, Nottingham, lace manufacturers.

### Dividends.

Dewhurst, J., jun., and Dewhurst, W. I. (trading as Jas. Dewhurst, jun., and Co.), Jacob Street, Bradford, Yorkshire, stuff merchants, rs. 3 5-16d. (second and final), 32, Park Row, Leeds.  
Field, J. (separate estate), Skelmanthorpe, near Huddersfield, fancy woollen manufacturer, rs. (second and final), E. A. Beaumont, 24, Queen Street, Huddersfield, chartered accountant, trustee.  
Field, W. (separate estate), Skelmanthorpe, near Huddersfield, fancy woollen manufacturer, rs. 2d. (second and final), E. A. Beaumont, 24, Queen Street, Huddersfield, chartered accountant, trustee.  
Morris, R. (separate estate), 119, Sherwood Street, Nottingham, lace manufacturer, trading with Thomas Arthur Pratt, as Morris and Pratt, 11d. (first and final), Offices of the Trustee, Thomas Leman, Long Row, Nottingham, chartered accountant.

### Dissolutions of Partnership.

Dewhurst, W. H., and Ratcliffe, W., Commercial Mills, Ormerod Street, Accrington, Lancashire, cotton spinners.  
Hartley, R., and Tambaci, J., 12A, Norfolk Street, Manchester, yarn agents.  
Thornley, E. W., and Brewill, A. W., Nottingham, lace manufacturers.  
Whittaker, G., Roberts, J., Crossley, J., and Knowles, R. T., Accrington, Lancashire, cotton manufacturers.

## PATENTS.

### Applications for Letters Patent.

A novel arrangement for preventing vibrations in spindles and flyers. J. Barbour and J. B. Pirrie, Belfast. 24th Nov. 15,300  
Automatic weft stop mechanism for looms. J. Paterson and T. Brook, London. 17th Nov. 14,941  
Automatic and other lubricators. J. B. Foulds, London. 19th Nov. 15,068  
Burners for gas singeing cloth. D. Hunter, Glasgow. 4th Nov. 14,186  
Beaming or warping threads. S. Brooks, London. 8th Nov. 14,387  
Bleaching vegetable fibres, &c. D. A. Louis, London. 9th Nov. 14,427  
Bleaching, damping, and dyeing loose fibres, yarns, threads, &c. E. and G. E. Sutcliffe, Halifax. 18th Nov. 14,971  
Belts or bands. M. Gandy, Liverpool. 22nd Nov. 15,159  
Carbonizing and neutralizing rags, &c. J. Illingworth and G. Tolson, Halifax. 24th Nov. 15,303  
Cutting the pile of piled fabrics. W. Howarth, London. 29th Oct. 13,884  
Cutting double-pile fabrics and mechanism therefor. J. A. Bright, Manchester. 30th Oct. 13,940  
Charging and impregnating weaving sheds, &c., with moisture. W. Bracewill, Chorley. 6th Nov. 14,323  
Cloth shearing. H. Wyckhuysen, London. 9th Nov. 14,488  
Connecting the check strap to loom pickers. W. A. Craven, Halifax. 19th Nov. 15,026  
Combing machines. A. Kapteyn, London. 23rd Nov. 15,261  
Drums or pulleys. A. C. Willis, London. 3rd Nov. 14,139  
Doubling or twisting yarns or threads. S. Brooks, London. 8th Nov. 14,388  
Drying wool, cotton, &c. J. Illingworth, Halifax. 9th Nov. 14,429  
Dobbies for weaving. J. Dawson, J. Clegg, and J. Dawson, London. 13th Nov. 14,735  
Driving belts and wheels. W. L. Purves, Wimbledon. 17th Nov. 14,783  
Fancy cloths. W. Murgatroyd, Bradford. 3rd Nov. 14,135  
Finishing calenders. H. Bury, Salford. 20th Nov. 15,089

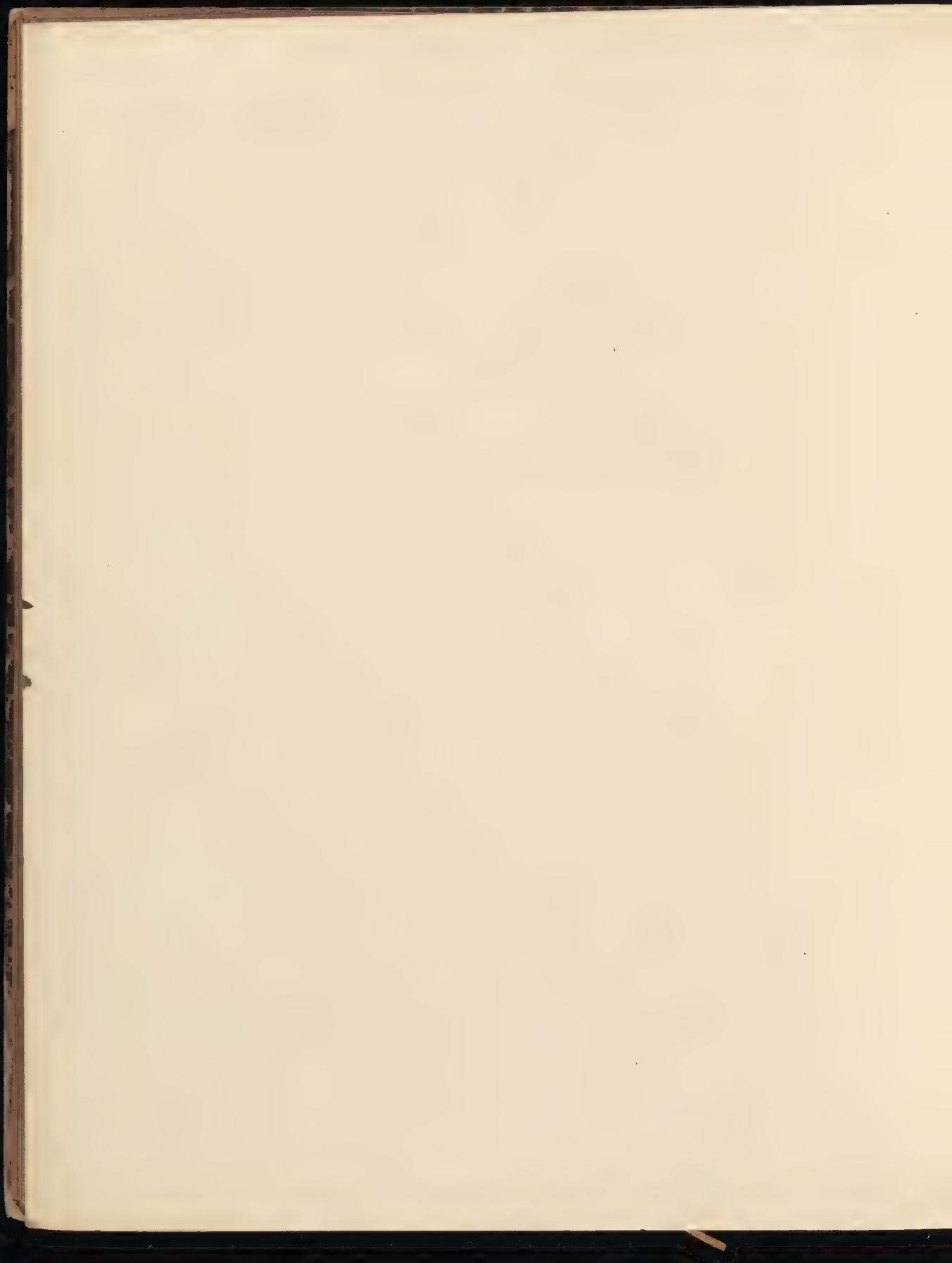
Finishing lace, &c. L. Lindley, London. 23rd Nov. 15,290  
Improvements in looms to adapt them for Axminster carpets. W. C. Ingham, Halifax. 5th Nov. 14,254  
Leather and other driving belting. B. Binks, Halifax. 25th Nov. 15,377  
Loose reed, in warp letting off, cloth turning back, and in treadle motions of looms. C. Catton, Halifax. 23rd Nov. 15,221  
Loose reed looms. G. F. Bancroft and S. Hopkinson, London. 29th Oct. 13,916  
Looms for Smyrna and Persian carpets or other plush goods. F. L. Wächter, Halifax. 30th Oct. 13,976  
Looms. R. Wallbank and W. Harris, Bradford. 8th Nov. 14,374  
Loose reed, in warp letting off, cloth turning back, and in treadle motions of looms. C. Catlow, Halifax. 23rd Nov. 15,221  
Loom shuttle guard. J. Brown, Manchester. 10th Nov. 14,499  
Lace fabrics. J. J. Loewenstein, London. 13th Nov. 14,733  
Lubricating composition. F. T. Archer, G. W. Hardy, and F. J. Archer, London. 16th Nov. 14,835  
Lubricators. W. Robinson, London. 18th Nov. 15,003  
Looms for chenille, &c., fabrics. R. Boyd, jun., and E. Lepainteur, Glasgow. 19th Nov. 15,033  
Mechanical arrangements connected with the rubbing leathers used in the manufacture of woollens, worsted, &c., yarns, or threads. J. Y. Johnson, London. 2nd Nov. 14,114  
Manufacture and application of composition for textile or woven bands, &c. J. C. Fisher and I. Jackson, Manchester. 4th Nov. 14,181  
Manufacture of yarn. C. Dewhurst and J. M. Riley, Halifax. 6th Nov. 14,318  
Method of and apparatus for sizing or dressing textiles. A. C. Henderson, London. 11th Nov. 14,610  
Oscillating tappets of looms. T. H. Chadwick, B. Marshall, and W. Taylor, Manchester. 20th Nov. 15,103  
Opening and cleaning cotton, wool, &c. T. and S. Buckley, London. 20th Nov. 15,106  
Preventing vibration of the warp beam in looms, and for equalising the tension on the warp. J. E. Bamford, W. Livesey, W. A. Smithies, and W. Middlemost, Halifax. 5th Nov. 14,250  
Printing on calico, &c. A. S. Young, Manchester. 6th Nov. 14,316  
Preparing silk cocoons for reeling. E. W. Serrell and E. Fougeirol, Paris. 8th Nov. 14,367  
Picker for looms. J. Turner and E. Porter, Preston. 8th Nov. 14,371  
Pickers for looms. J. Dawson and H. Armistead, Halifax. 10th Nov. 14,496  
Preparing bales of wool for sorting and washing. G. Bottomley and W. H. Greenwood, London. 24th Nov. 15,336  
Pulleys. F. Myers, Leeds. 13th Nov. 14,721  
Punching jacquard cards. B. Toone, Glasgow. 19th Nov. 15,034  
Reeling silk from cocoons. E. W. Serrell, Paris. 18th Nov. 14,906  
Regulating the tension of the warp in looms. B. Wilkinson, K. Jowett, and A. E. Parratt, Bradford. 20th Nov. 15,130  
Shedding motion. R. T. Greenwood and W. H. Hayhurst, Halifax. 23rd Nov. 15,219  
Sight feed lubricator. A. Fieldwick, Manchester. 25th Nov. 15,348  
Soaping, scouring, and cleansing printed and dyed fabrics. T. O. Arnfield, Manchester. 25th Nov. 15,355  
Softening and preparing hemp and other fibres and machinery therefor. G. Walker, London. 29th Oct. 13,894  
Spinning and winding yarn. D. Maitland, Manchester. 1st Nov. 14,018  
Splitting and cutting broad cloth applicable to steaming and brushing mills, and improvement in such mills. S. Bolton, Halifax. 10th Nov. 14,515  
Sectional warping and beaming machines. J. H. Stott and J. Smith, Manchester. 17th Nov. 14,889  
Self-registering weighing machine. W. M. Preston, Bangor. 22nd Nov. 15,151  
Treatment of fibre and manufacture of textile fabrics. W. Scott, London. 4th Nov. 14,200  
Treatment or finish of stockinette fabrics. G. Lendrum, Huddersfield. 5th Nov. 14,251  
Twist lace machines and production of Mechlin net fabrics thereby. F. R. Enson, London. 5th Nov. 14,295  
Treatment of cotton or linen warps or warp yarns before weaving. T. Pickles, Manchester. 22nd Nov. 15,136  
Washing, scouring, and bleaching wool. T. Zebrowski, London. 23rd Nov. 15,285  
Winding of yarn in spinning and twisting machinery. G. Clegg, J. Thomas, and W. H. Harrison, Halifax. 17th Nov. 14,892

### Patents Sealed.

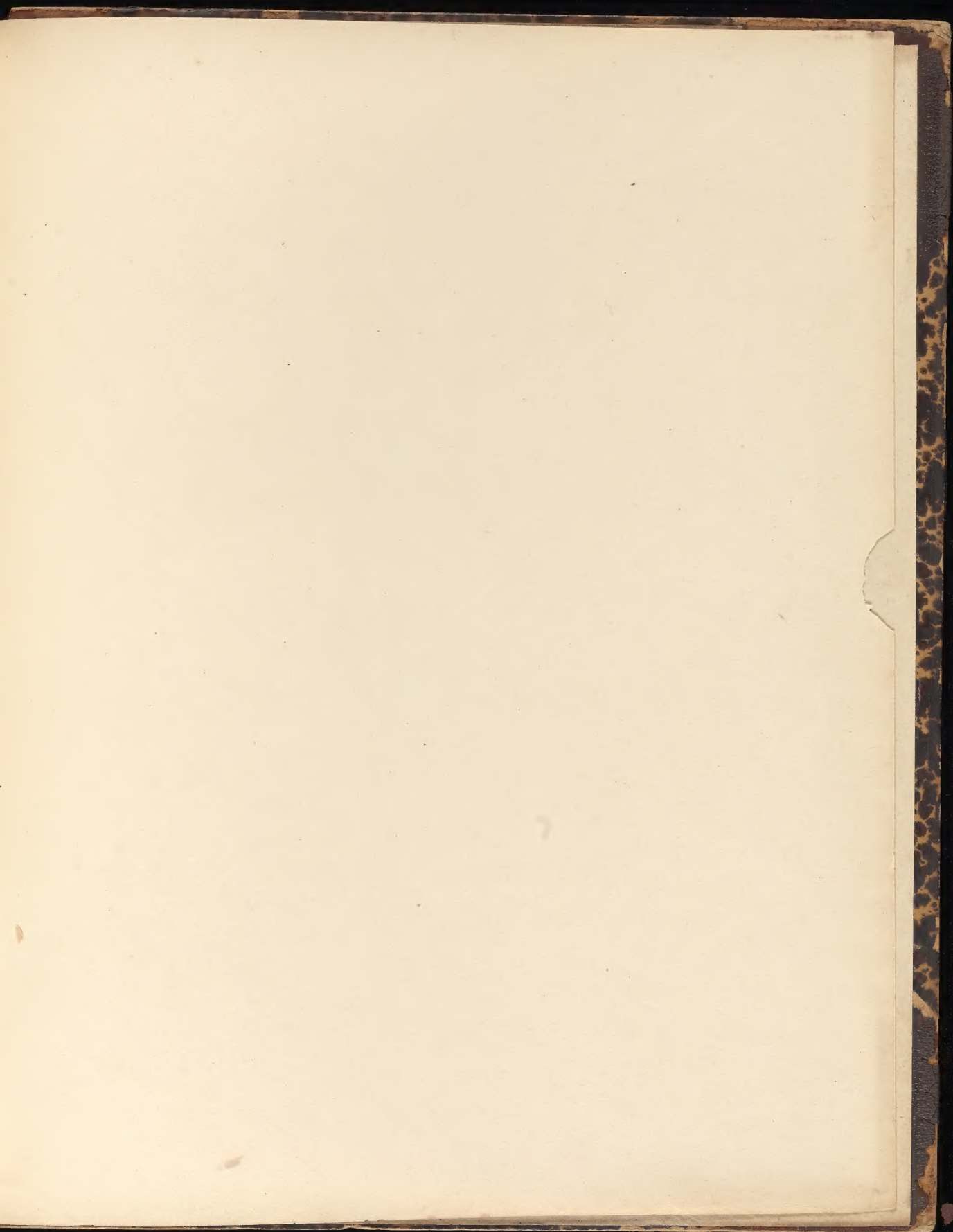
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11,468	13,156	13,301	13,404	13,494	13,635	80
1,840	12,395	13,071	13,427	13,784	13,790	13,020
13,926	14,009	14,034	15,296	11,246		











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